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USSR Report

AGRICULTURE

No. 1250

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LIVESTOCK FEED PROCUREMENT

UDC 633.2

METHODS FOR STRENGTHENING FEED BASE REVIEWED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 7, Jul 80
pp 78-85

[Article by N.G. Andreyev, VASKhNIL academician at the Moscow Order of Lenin and Order of the Red Banner of Labor Agricultural Academy imeni K.A. Timiryazev: "Methods for Strengthening the Feed Base"]

> [Text] ...To implement radical improvements in feed production and to create, during the next few years, a reliable and strong feed base for animal husbandry at each kolkhoz, sovkhoz and interfarm enterprise.
>
> L.I. Brezhnev
> From a report delivered before the July (1978) Plenum of the CPSU Central Committee.

The solving of one of the most important tasks associated with ensuring that the population is supplied with adequate quantities of high quality food products is dependent upon the status of animal husbandry. In his speech delivered before the November (1979) Plenum of the CPSU Central Committee, the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L.I. Brezhnev devoted serious attention to this problem.

Considerable resources are presently being invested in animal husbandry. A great amount of effort is also being given to accelerating the process of specialization and concentration in this branch and also to converting it over to an industrial basis. But the yield being realized from these expenditures is still quite negligible. It is believed that the reason for this lies in a weak supply of feed for the livestock. Today it is impossible to proceed in dairy and beef animal husbandry in the absence of modern equipment, a modern technology or a high level of organization for all processes. Nevertheless, one of the principal conditions, if not the main one, for realizing further progress for the branch continues to be that of having a strong and stable feed base available. Unfortunately, feed production is still not sufficiently strong for meeting the increasing requirements of animal husbandry. This is borne out by the alarming situation that prevails at the present time in certain regions of the country, the result of last year's unfavorable weather conditions.

The problem concerned with supplying animal husbandry with feed has two closely interrelated aspects. The first is quantitative in nature -- it assumes a considerable increase in the yield obtained from each hectare of land, so as to create an abundance of feed not only during the pasture period but also during the winter stabling period. The second aspect of the problem is qualitative in nature: for the country as a whole, animal husbandry is being undersupplied with plant protein to the tune of 4-5 million tons annually and this is causing a considerable over-expenditure of feed and, it follows, a deficit in feed in terms of quantity. Protein-balanced feed will aid in breaking up this cycle and solve the problem on the whole. Thus the quantitative aspect can never be separated apart from the qualitative aspect and the problem should be examined in its dialectical unity.

The principal trends for strengthening the feed base are well known: this includes, first of all, raising the cropping power of the agricultural crops on arable land by improving the agrotechnical practices employed in cultivating them, improving the structure of the sown areas and obtaining 2-3 harvests annually from the same area where possible; secondly, improving the natural feed lands and creating highly productive cultivated haying lands and pastures; thirdly, reducing losses to a minimum through the use of progressive technological methods for procuring and storing feed.

The scientific institutes and agricultural enterprises are carrying out a considerable amount of work in connection with all of these trends. The implementation of improvements in the structure of the areas used for feed crops must be viewed as one of the most important problems in field feed production. Taking into account the natural-climatic conditions found in each zone, the areas used for the more productive feed crops should be expanded and those for the less productive feed crops -- reduced in size. In the process, special attention should be given to the grain crops. In the nonchernozem zone and certain other regions, sowings of barley and oats for grain appear to be very promising and in steppe and arid regions -- corn. I would like to discuss corn in somewhat greater detail. Its potential is tremendous: possessing high feed qualities, it knows no equal in terms of cropping power. However, our gross yields of corn are still falling short of the requirements to a considerable degree. This is the result of a reduction having taken place in the harvesting areas for this crop and it is also caused by its low cropping power in certain regions. In some areas, for example the north Caucasus and the steppe and forest-steppe zones of the Ukraine, large areas are unjustifiably occupied by corn which is harvested for silage; insufficient use is being made of irrigated lands for the growing of corn for grain, with less than one fifth of the grain area being occupied by corn.

Meanwhile, computations have shown that the areas occupied by corn grown for grain can be increased throughout the country to 5.2 million hectares, including 1.2 million irrigated hectares, by reducing the sowings of less productive crops. Improvements in the cropping power of this crop represent a great reserve for increasing the gross yields of corn grain. Here a great amount of assistance can be obtained from the extensive use of the new industrial technology for cultivating this crop, which was initiated by leading machine operators in Chadyr-Lungskiy Rayon of Moldavia. The principal elements of this technology -- thorough cultivation of the soil, sowings carried out following the best and well fertilized predecessor crops, applications of optimum dosages of mineral fertilizers, the use of effective and fast-acting herbicides for combating weeds and the use of highly productive equipment that fully precludes the use of manual labor. In 1978 the corn growers in Chadyr-Lungskiy Rayon used this industrial technology and obtained 61.5 quintals of grain from each of 18,000 hectares without irrigation, or almost two times higher than the average annual cropping power for corn throughout the country. This year the new technology will be employed for growing this crop on an area of 1 million hectares on farms in the Russian Federation, the Ukraine, Kazakhstan, Georgia and Moldavia.

The scientist-plant breeders have created corn hybrids which are not inferior to the conventional analogs in terms of productivity and which surpass them by 60-80 percent in terms of the content of the irreplaceable amino acid lysine. This raises still higher the value of this crop.

Mixed feed that is balanced in terms of protein and certain irreplaceable amino acids must include no less than 12.5 percent pulse crop grain. However, the requirement for such grain is being satisfied by less than three percent at the present time. Thus it is necessary to increase the production of such pulse crops as peas, lupine, soybeans and feed beans which, according to data accumulated over a period of many years by the State Committee for the Strain Testing of Agricultural Crops of the USSR Ministry of Agriculture, ensures a yield on the average of from 550 to 900 kilograms of protein per hectare depending upon the crop.

Peas -- one of the principal pulse crops in our country -- furnishes up to 30-35 quintals of grain per hectare. Varieties having a potential cropping power of 50 or more quintals per hectare have been bred by the country's scientific institutes. A pea variety having seed which does not shatter during cracking of the beans has been regionalized in 49 oblasts, krays and republics of the country and this is expected to reduce crop losses considerably, especially during damp years. On the agenda -- the creation of varieties having a raised drought resistance and also suitable for mechanized harvesting. An expansion of the areas occupied by peas from 6 to 7-7.8 million hectares will make it possible to obtain 13-14 million tons of high protein grain, or approximately 2.5 million tons of digestible protein.

Soybeans, the seed of which contains more than 40 percent protein and 18 percent fat, beyond any doubt occupies first place among all of the pulse crops in terms of nutritional value. The overwhelming majority of plantings of this crop in our country is concentrated in the Far East, where rich experience has been accumulated in cultivating it. The most important means for increasing the productivity of soybeans there is that of raising its cropping power, since the opportunities for substantially expanding the plantings have already been exhausted for all practical purposes. However, the production of this valuable crop is still increasing slowly. A modern industrial technology for cultivating and harvesting the crop and for the post-harvest processing of the grain is slowly being introduced into operations. Quite often the fertilizer applications for the soybeans are 2-3 times less than the scientifically sound norms and no system of machines is available for the complex mechanization of soybean cultivation.

Soybean production can be increased considerably by creating a new and large-scale base for cultivating it in the European part of the country, mainly on irrigated lands in the southern Ukraine, in Moldavia, the north Caucasus, the Volga region and also in southern Kazakhstan, Uzbekistan, Kirgizia and Azerbaijan. A portion of the plantings in these regions can be grown on nonirrigated lands. Computations have shown that, assuming the availability of fertilizers, herbicides, special equipment and efficient organization of varietal seed production, soybean plantings for grain can furnish considerable yields and thus such plantings must be increased to 2 million hectares during the next few years.

In addition to peas and soybeans, other pulse crops are also distinguished by their protein content -- lupine, vetch, kidney beans, peavine and chick peas. A white lupine variety has been created by scientists which furnishes 35-40 quintals of seed per hectare. An increase in the production of the grain of these plants would represent a considerable contribution towards solving the protein problem.

An important trend for improving the structure of the feed lands is that of expanding the plantings of the more productive perennial grasses and reducing the areas sown in annual grasses. The experience of scientific institutes and the practice of leading farms have underscored the high effectiveness of perennial grass cultivation. For example, at the Moscow Sovkhoz-Combine imeni 50-Letiye SSSR, which includes two industrial complexes for milk production, perennial grasses provide the foundation for feed production. They are grown on 2,450 hectares, or 70 percent of the farms arable land. Having rejected the expensive and low productivity annual grasses, the sovkhoz sowed its available areas in red clover, timothy, dew grass, meadow fescue and meadow foxtail. And at no time have the perennial grasses failed the farm -- they furnish stable and high yields during both dry and excessively damp years. In 1978, for example, 280 quintals of fodder were obtained from each hectare. The feed has become considerably cheaper, since during the past 3 years the production cost for 1 feed unit obtained from perennial grasses has not exceeded 4 kopecks.

At the Zarya Kommunizma State Breeding Plant in Moscow Oblast, the chief branches of the farm are the production of milk and the raising of highly productive pedigree young large-horned cattle stock. In the structure of the areas under crops, 35 percent of the land is occupied by grain crop plantings, the cropping power of which in recent years has exceeded 50 quintals per hectare. The feed fields consist of 2,800 hectares, of which 1,500-1,600 hectares are planted in perennial grasses that furnish yields of 85-87 quintals per hectare, in a conversion for hay, 50 hectares are occupied by corn, 164 hectares by feed beets and the remaining area is used for growing vetch-oats mixtures. Dairy animal husbandry, which is based upon industrial methods of management, is fully supplied with internally produced feed.

An irreplaceable feed crop for many regions of our country is that of alfalfa, the fodder and hay of which resemble concentrated feeds in terms of protein content and digestibility; in addition, they surpass all cereal and certain leguminous grasses. It was by no means an accident that the decree of the CPSU Central Committee and the USSR Council of Ministers entitled "Additional Measures for Increasing the Production of Coarse and Succulent Feed During 1980 and Raising Its Quality" called for a considerable expansion in the alfalfa fields during the next few years. However, the carrying out of this task is being delayed by extremely poor organization of seed production work for perennial grasses generally and for alfalfa in particular. The low yields of seed and the considerable seed losses experienced during the harvesting and processing work were associated with a shortage of fertilizer, insufficient specialized harvesting and seed-cleaning equipment and with extremely slow development of the process of specialization and concentration in seed production.

Every attempt must be made to accelerate the development of a solution for these problems, since they are seriously delaying the intensification of feed production.

The Soviet plant breeders have developed promising forms of alfalfa which furnish up to 150 quintals of hay per hectare from multiple cuttings. Highly productive varieties of awnless brome grass (with a cropping power of up to 130 quintals of hay per hectare), clover, reed grass for peat bogs and flood-plain soils and meadow fescue and cock's-foot for multiple cutting usage have also been created based upon the harvesting of grasses during different phases of growth. These varieties are making it possible to increase the per-hectare yield of feed by one and a half to two times.

Intermediate sowings represent a great reserve for increasing the production of feed and protein output in regions of adequate moisture and on irrigated lands. Such sowings make it possible to obtain two and in some regions three harvests annually from the same tract of land. The irrigated lands found in Central Asia, the Trans-Caucasus, the Volga region, the north Caucasus and the southern Ukraine are especially favorable for cultivating these varieties. Here each hectare of such plantings is capable of furnishing 18,000-20,000 or more feed units and from 18 to 25 quintals of protein. Computations have shown that the area of intermediate sowings in our country, which currently amounts to roughly 3 million hectares, can be increased to 12-13 million hectares.

New and highly productive forage crops are playing a considerable role with regard to strengthening the feed base of animal husbandry. Recently, such crops as rosin weed, leuzea, milk vetch, colewort, mallow and others have been studied and recommended for production. The Sosnovskiy, Uspekh and Severyanin varieties of cowparsnip, which have a productivity of 1,000 quintals and more of fodder per hectare (from two cuttings) have been developed and regionalized.

The intensive cultivation of feed on field plots is impossible in the absence of specialized feed crop rotation plans being introduced for the production of green feed, haylage, silage, grass meal, briquettes and granules. Such crop rotation plans must become the principal element for ensuring that feed is made available for the animals at large-scale livestock complexes. The task of the scientists consists of developing scientifically sound recommendations for introducing feed crop rotation plans for the various types of farms, in conformity with the specific conditions found in each natural-climatic zone.

The natural feed lands, of which there are more than 370 million hectares in our country, must be viewed as a tremendous reserve for strengthening the feed base. As a rule, the grass yield obtained from such land in a natural state amounts to 500-700 feed units per hectare. Meanwhile, a complex of methods for implementing superficial and basic improvements in these lands, developed by scientist-meadow experts and borne out by many years of extensive production experience, is making it possible to raise their productivity to 4,000-5,000 feed units per hectare with natural moisture and up to 8,000-10,000 feed units and more per hectare under irrigation conditions. The use of improved meadows as cultivated pastures can fully ensure the availability of feed for large-horned cattle, especially for a milking herd and pedigree young stock. The grass of cultivated pastures is considered to be a very rich type of biological feed: 1 feed unit contains 110-120 grams of digestible protein. The grazing of cows on cultivated pastures solves the feed protein problem almost completely during the summer period, at which time, as is well known, up to 60 percent of the annual milk yield is obtained from the cows. The need for a protein top dressing completely disappears. To the contrary, in order to balance the ration in terms of the principal nutrients, a small quantity of carbohydrates should be added to the feeding troughs of animals which consume pasture fodder.

Grassy feeds obtained from cultivated grazing and haying lands, in addition to having a rich composition and high nutritional value, are distinguished by low production costs -- the expenditures per feed unit usually do not exceed 1.5-2 kopecks. For the purpose of comparison, we would point out that in the central regions of the forest zone the production cost for one feed unit of root crops is 16.3 kopecks, potatoes -- 12.2 and perennial grasses -- 3.5 kopecks.

The use of such lands eliminates the annual expenditures for cultivating the soil, carrying out sowing and harvest operations and for transporting and distributing the feed to the animals and this in turn lowers the production costs for animal husbandry products. This is clearly apparent at such farms in Moscow and Pskovskaya oblasts as the Borets, Leninskiy Luch, Krasnoye Znamya and Rassvet kolkhozes, the Zarya Kommunizma, Novoselki, Novosokol'nicheskiy and Pukhnovo sovkhozes and at other farms, where cultivated pastures have been in use for many years. During the pasture period, the production cost per quintal of milk at these farms amounts to 12-14 rubles, compared to an average annual production cost of 18-22 rubles and higher.

On irrigated pastures and as the result of a good water supply, moisture-loving perennial grasses and improved use of fertilizers and soil nutrients, fodder is obtained in a comparatively uniform manner throughout the entire growing season, regardless of the caprices of weather. From the end of May until the beginning of July, surplus feed forms on these lands, feed which cannot be utilized fully by the animals during grazing. The excess fodder is used for the production of haylange, grass meal, feed briquettes or granules.

By creating highly productive cultivated pastures capable of providing sufficient food per hectare for no less than 3-4 cows during the pasture period, with no green feed supplement required, the farms are able to make considerable additional areas of arable land available for the growing of grain forage and other forage crops used during the winter stabling period, land that was previously used for sown grasses.

Pasture maintenance exerts a many-sided and positive effect upon animals -- it improves their growth and development, it promotes greater resistance of an organism to various diseases and it creates favorable conditions for obtaining healthy offspring. According to data obtained from production experiments carried out over a period of many years at the Trans-Carpathian Agricultural Experimental Station, pasture maintenance for pedigree calves turned out to be more effective than indoor maintenance. In the case of grazing, 400 more kilograms of milk were obtained per cow during the first and second lactations and the rate for normal calvings was 100 percent. On the other hand, the figures for indoor maintenance were 75 and 89 percent respectively. Similar data was obtained at the Voronovo and Konstantinovskiy sovkhozes in Moscow Oblast.

All of the above clearly underscores the fact that the creation and use of cultivated pastures constitute the most effective method for organizing a summer feed base and that it is one of the most important trends for solving the protein problem. However, the work of improving the natural feed lands is still not being carried out in a rapid manner. For example, the following is a brief description of the status of affairs in Moscow Oblast, which at one time was a pioneer in the creation of cultivated pastures and even today occupies a leading position in the carrying out of this work. There are roughly 515,000 hectares of natural feed lands in the oblast, of which amount approximately one fourth -- 125,000 hectares -- is improved land. A considerable portion of the meadows and pastures is in very unsatisfactory condition from a land reclamation standpoint: almost 104,000 hectares are overgrown with shrubs and young trees and more than 37,000 hectares are water-logged. More than 120,000 hectares of dry valley land are in need of radical improvements and 112,000 hectares of water-logged land require drainage. The above picture is typical of many regions throughout the country.

Why is it that this very necessary and important work is proceeding so slowly? One reason -- a shortage of perennial grass seed. Another reason -- a shortage of fertilizers. During the Ninth Five-Year Plan, for example, only one third of the improved haying and pasture lands was fertilized, with no more than 30 kilograms of nitrogen, six of phosphorus and 11 kilograms of potassium being applied per hectare, or at least five times less than the optimum dosage. Nor is this situation improving very much at the present time. Other reasons also include a shortage of intelligent meadow specialists, the absence of specialized equipment and so forth. By no means wishing to cast doubt upon the restraining effect of these factors, I nevertheless would like to cite as one of the principal causes -- failure on the part of certain local leaders to devote adequate attention to the problem of strengthening the meadow and pasture economy. For example, can we consider as normal a situation wherein on lands located in traditional animal husbandry regions, where cattle have grazed since time immemorial as the saying goes, irrigated tracts are being created and used not for feed purposes but rather for other crops, the cultivation of which is viewed as a new undertaking for these regions and one with a doubtful future?

In our vast and diverse (from the standpoint of natural conditions) country, there are lands which must be employed only for feed purposes. For example, let us take flood plain lands. Such lands are characterized by raised fertility levels, the result mainly of regular high water flooding and the depositing of silt. These features of flood plain lands limit and complicate their use for field crop purposes: during plowing, for example, the threat of water erosion arises and difficulties are encountered in connection with the timely deliveries and operation of agricultural machines and units. Moreover, work is hampered by the irregular terrain in the form of lakes, dry river beds, canals and so forth. At the same time, the meadow use of flood plain lands produces exceptionally high results. In terms of hay productivity, they surpass non-flood plain lands by 2-3 times and more. One half of all hay procured in our country is obtained from flood plain lands, despite the fact that their area amounts to no more than 20 percent of all of the haying lands. As a rule, flood plain hay is rich in protein, carotene, vitamins and microelements. It is by no means an accident that all of the best domestic strains of large-horned cattle were bred in flood plain regions.

However, considerable areas of flood plain land, owing to the fact that they are not being tended properly, have become overgrown with undergrowth and small trees and are water-logged and thus they require radical and surface improvements. Experience has shown that land reclamation measures carried out on such lands produce high economic results. Flood plain meadows in all zones of our country must be utilized for obtaining only special purpose and programmed yields of high quality grass.

Solonetz soil constitutes still another specific type of natural feed land, the potential of which, for increasing the production of feed, is being employed to only a minor degree. There are more than 100 million hectares of such land in Kazakhstan and Siberia. The grass cover on such soils is usually poor, extremely sparse and the yield of dry bulk does not exceed 2-3 quintals per hectare. Yet the reclamative development of solonetz soils, which raises their productivity considerably, constitutes a powerful reserve for strengthening the feed base of animal husbandry. Completed studies have established the fact that an effective increase in the productivity of solonetz soil feed lands, in the zone of dry steppes, is achieved in those instances where the reclamative measures create an optimum water and air regime for the soil and a productive duration for the agrophytocenosis and the full value of the seedlings. This is dependent not only upon the biological characteristics of the crops sown and the presence of a well cultivated layer on the soil's surface, but also upon a favorable salt regime throughout the entire root zone.

In conclusion, I would like to touch upon still one more problem considered to be extremely important at the present time -- the organization of labor in feed production. The July (1978) Plenum of the CPSU Central Committee raised the question concerning the conversion of feed production into an independent and specialized branch. This question brooks no delay -- a solution for it is a vital necessity. In the absence of specialization, it is impossible to convert feed production into a highly intensive independent branch capable of meeting the requirements of modern animal husbandry of the industrial type. However, it must be remembered that specialization is a complicated and multi-stage process. In each specific instance, when introducing new forms and methods for organizing labor at a particular farm or group of farms, the degree to which the farms are prepared for the particular level of specialization must first of all be taken into account. If this is not done, a fine idea may be discredited and the development of an important process held up.

What should the process of specialization in feed production be like today? At its highest stage there must be interenterprise associations for the production of mixed feed, grass meal, full ration feed and protein-vitamin additives; interenterprise plants for the briquetting and granulation of feed; production associations for the operation of irrigated cultivated pastures and haying lands. These enterprises must operate on the basis of a very modern technology and they must have at their disposal the latest means for the mechanization and automation of production. We are only now beginning to creat the prototypes for such associations. Specialized feed production farms -- the satellites of large-scale livestock complexes -- are more widespread. A majority of the kolkhozes and sovkhozes having livestock farms require intrafarm specialization -- the creation of permanently active specialized brigades for the production of feed, with feed crop rotation plans, tracts of cultivated pasture land, appropriate equipment and so forth being assigned to these brigades. During the summer these brigades must ensure that the production and procurement process for all types of feed is carried out and during the winter -- the storage, processing and delivery of the feed, carting of fertilizers out to the fields, equipment repair work and seed preparation. The work performed by the brigades is paid for based upon the quantity and quality of the feed produced. The production of feed must be a vital concern of all those to whom the work is entrusted -- feed procurement team, brigade, specialized farm, interenterprise association. The responsibility of specific individuals and a creative approach in carrying out the work -- a mandatory condition and a guarantee for successfully solving the problem of increasing the production of feed and raising its quality.

In order to create an abundance of feed not only during the pasture period but also during the winter stabling period, the yield obtained from each hectare of land must be raised considerably on the one hand and the feed must be balanced in terms of protein on the other. The principal trends for strengthening the feed base are considered to be the following: raising the cropping power of the agricultural crops on arable land by improving the agricultural practices employed in cultivating them, improving the structure of the areas under crops, obtaining 2-3 yields annually from the same area where such is possible; improving the natural feed lands and creating highly productive cultivated haying lands and pastures; reducing losses to a minimum through the use of progressive technological methods for procuring and storing the feed.

The responsibility of specific individuals and the use of a creative approach in carrying out the assigned tasks will serve to guarantee the successful solving of all of these problems.

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LIVESTOCK

IMPORTANCE OF INCREASING MEAT PRODUCTION IN USSR

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVO in Russian No 7, Jul 80 pp 3-10

[Article by Gennadiy Yakovlevich Yelistratov, candidate of economic sciences and head of the agriculture department at USSR Gosplan: "The Paramount Challenge"]

> [Text] "The concrete steps aimed at development of animal husbandry were thoroughly reviewed at the July 1978 Plenum of the CPSU Central Committee. To carry out the resolutions of the Plenum and significantly increase meat production in the country is the foremost duty of the leaders of the agricultural sector, local party and Soviet bodies, specialists, and all employees of animal husbandry" -- L. I. Brezhnev at the November 1979 Plenum of the CPSU Central Committee

The resolutions of the July 1978 Plenum of the CPSU Central Committee, which was held just two years ago, touch the vital interests of all the working people of our country. They are our principal guideline in working out and implementing the basic lines of further development of agriculture in the coming period.

Increasing meat production is one of the most important national economic challenges defined by the resolutions of the July 1978 Plenum for the near future. The necessity for our party to formulate this complex task arose from a desire to improve the structure of the Soviet diet and to satisfy the demand for meat products, which is especially marked today, more fully. In terms of total calorie content the diet of the inhabitants of our country surpassed the scientifically substantiated requirement at the beginning of the current five-year plan. But for certain products the fast-growing needs of the population are not being fully met. One of those products is meat.

The July 1978 Plenum of the CPSU Central Committee thoroughly analyzed the issues of continued development of animal husbandry and set concrete goals for meat production in the 11th Five-Year Plan. The Plenum pointed out ways to solve this complex problem. "While we increase the number of livestock," Comrade L. I. Brezhnev stated at the Plenum, "our main job will be to raise the productivity of all types of livestock and poultry, switch to intensive methods of managing animal husbandry, and convert it into a modern, highly efficient sector everywhere, as quickly as possible. The paramount challenge is to increase meat production. To meet it we must make full use of all our potential and reserves and strive to increase the production of all types of meat."[1]

In the last decade per capita consumption of meat has risen noticeable, from 48 to 57 kilograms. All of this growth, however, was achieved during the Ninth Five-Year Plan. In the current five-year plan, despite overall growth in the volume of meat production, per capita consumption has changed only negligibly.

The 10th Five-Year Plan began, of course, in an extremely difficult situation for animal husbandry. The number of livestock was sharply down after the drought of 1975. Suffice it to note that the number of hogs was 14 million less than in 1974, sheep were down 4 million, and poultry 44 million. In the first year of the 10th Five-Year Plan the production of almost all types of livestock products was lower than in 1974-1975, and meat production was even below the average level for 1971-1975. Truly herculean efforts were needed to surmount such results. By 1977 the number of cattle and poultry had already surpassed the 1971 level and the hog and sheep herds were fully restored in 1978. Table 1 below shows the changes in numbers of livestock and poultry by years.

Table 1. Number of Livestock and Poultry at All Categories of USSR Farms (end of year)

	1970	1975	1979
Cattle	99,200,000	111,000,000	115,000,000
In Above, cows	39,800,000	41,900,000	43,300,000
Hogs	67,500,000	57,900,000	73,700,000
Sheep and Goats	143,400,000	147,100,000	149,200,000
Poultry	535,000,000	544,000,000	619,000,000

At the present time we have 0.53 of a standard head of livestock per inhabitant of the country, which is much more than other countries with developed agriculture. But the production potential that has been established in the form of numbers of animals is still working at half strength. For a long time now weight gains of about 100 and 80 kilograms per head of cattle and hogs, respectively, have been gotten in the public sector. But the best farms exeed these indicators by 40-50 percent. Where the live weight gain is too low the period of raising and feeding out cattle takes about two years, and at many farms it is even more. This wastes a large amount of feed. Thus, raising the productivity of livestock and poultry remains the chief reserve for further growth in the production of animal husbandry output.

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[1] Brezhnev, L. I., "Speech at the 27 November 1979 Plenum of the CPSU Central Committee. Decree of the Plenum," Moscow, Politizdat, 1979, 17 pages.

A great deal has been done in the 10th Five-Year Plan to bolster the material-technical base of animal husbandry and switch it to an industrial footing. As before, about one-third of all capital investment for production purposes went for construction of animal husbandry facilities. Most livestock in the countryside today are housed in well-made structures, although a certain shortage of standard, highly mechanized animal husbandry quarters continues. By the end of the 10th Five-Year Plan almost half of all buildings for cattle, about 40 percent of hog quarters, and almost 90 percent of poultry facilities will be fully mechanized. This will create a good foundation for highly intensive animal husbandry.

At the November 1979 Plenum of the CPSU Central Committee Comrade L. I. Brezhnev observed: "Everyone is aware of the complexity of animal husbandry. But a great deal is being done for the sector. Even though our direct grain needs have long since been fully met we continue to build up grain production, for the sake of feed. Thousands of new livestock farms and complexes have been built. The size of the livestock herd is very impressive. A few years ago a special sector was established to produce machinery for animal husbandry and feed production.

"But the return from all this is still very small."[2]

The principal factor retarding the development of animal husbandry is the substantial lag in the feed base. This has become especially noticeable in the 10th Five-Year Plan when a large number of industrial-type animal husbandry complexes have been launched. When they are provided with feed the production of animal husbandry output per head of livestock begins to grow rapidly. But most of the animals are not realizing their potential; their productivity remains very low.

Development of the feed base still lags significantly behind growth in the number of livestock, and as a result the level of livestock nutrition is changing very slowly. In 1970 22.8 quintals of feed units was used for each standard lead of livestock; in 1978-1979 the expenditure was 25-26 quintals of feed units. Considering that part of this feed was sent to livestock complexes and poultry factories where the level of feeding is very high, we find that most of the kolkhoz and sovkhoz livestock farms today are using about as much feed per standard head today as they did 10-15 years ago.

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[2] Brezhnev, op. cit.

The use of concentrated feeds has been intensified to make up for the shortage of feed in recent years. In absolute figures the use of concentrates has increased 40 percent, while their share of total feed expenditures has risen from 30.8 to 34.2 percent. The overall increase in concentrated feeds has had a beneficial effect on the development of poultry and hog raising, but it has not significantly changed the indicators for cattle, which account for the largest part of meat produced by livestock farms. Practically all the growth in beef production in recent years has been through extensive factors. The increase in the weight of beef cattle sold has occurred mainly through longer raising and feeding out. Feed expenditures per quintal of weight gain of cattle rose from 11.5 quintals in 1970 to 12.8 in 1979, and the prime cost of output also rose.

Solving the problem of the quality of the feed consumed is very important. At the present time the protein requirement is only 80-85 percent satisfied. Even in planning calculations the annual deficit of digestible protein is about 3.5 million tons, and the actual figure is much larger.

The country has begun carrying out the comprehensive program for development of feed production ratified by decree of the CPSU Central Committee and USSR Council of Ministers in 1978. This program is calculated until 1985. It envisions steps to improve field feed production, natural haymeadows and pastures, a further increase in land reclamation, chemicalization, and mechanication of feed production, introduction of progressive technologies for laying in and storing feed, and preparing feed for the animals. In addition, attention has been focused on increasing the production of industrially produced feeds such as feed yeasts and lysine.

The decree entitled "Additional Steps to Increase the Production of Coarse and Succulent Feeds in 1980 and To Improve Their Quality" is new testimony to the concern of our party and state for the development of feed production. The decree directs the attention of party, Soviet, and agricultural agencies to the need for full supply of full-value coarse and succulent feed to public animal husbandry and livestock kept by private individuals and to economize on the use of grain for fodder. Supplementary measures of material incentive for increasing the volume of feed and improving its quality have been developed. Implementation of these measures will create a good foundation for continued growth in the production of all types of livestock products.

There are opportunities for increasing feed production everywhere. According to figures from scientific institutions, losses of feed from untimely harvesting and improper storage are 30 percent of the total production of feeds. A significant reduction in losses is entirely realistic even with present farm equipment. To guarantee the development of animal husbandry at a relatively high level agricultural enterprises must have at least 35 quintals of feed units per head of livestock, which means an increase of 25-30 percent in the production and use of feeds compared to the current level. It is important in this to organize continuous feeding of livestock in conformity with the technology adopted; this makes it possible to avoid excessive feed expenditures per unit of output produced.

Many rayons and oblasts in the country have accumulated useful know-how in solving questions of feed production. For example, the farm workers of Vinnitskaya Oblast are working energetically to increase the production and storage of feed. The kolkhozes and sovkhozes of the oblast have formed feed-procurement brigades and teams and staffed them with highly skilled workers. Comprehensive feed production plans have been worked out. The practices of the farms of Vinnitskaya Oblast are finding broad support among farm workers in other oblasts, krays, and republics.

The animal husbandry workers of our country face complex challenges in the 11th Five-Year Plan. According to the resolutions of the July 1978 Plenum of the CPSU Central Committee 19.5 million tons of meat, slaughter weight, must be produced by the end of the five-year plan, which means to increase production by 4 million tons over 1979. We have never had such growth in meat production in any of the earlier five-year plans. For comparison let us note that the average annual production of meat, slaughter weight, in the 10th Five-Year Plan is expected to be about 1 million tons more than in the Ninth Five-Year Plan. Accomplishment of this task requires mobilization of enormous efforts and a comprehensive approach to using existing possibilities of increasing production.

A great deal of work has been done in the 10th Five-Year Plan to enlarge the role of the private auxiliary farms; meat production and other animal husbandry products are included in this. It is common knowledge that a special decree was adopted in September 1977 on further development of individual auxiliary farms. The steps that have been taken are having a beneficial effect on increasing the number of livestock and poultry kept by individuals and increasing state purchases of animal husbandry products. They make it possible to use existing capacities more fully to increase production. At the present time about 30 percent of the total volume of meat production comes from the auxiliary farms. Nonetheless, the primary area of efforts by livestock workers in the country is improving the quality indicators of animal husbandry in the public sector by every means.

Cattle raising plays the leading role in formation of the country's meat balance. Beef has a high proportion of the meat produced in the country, more than 47 percent at the present time. It is produced in all regions of the country, and cattle raising has great potential for further growth in all regions. More than 25 million head are slaughtered for meat in our country each year with an average weight of 320-330 kilograms. This is far from exhausting the potential of the breeds that are raised. Raising the weight of beef cattle sold to 440-450 kilograms, as stipulated in the resolutions of the July 1978 Plenum of the CPSU Central Committee, will make it possible to increase meat resources, slaughter weight, by 1-1.5 million tons with the same number of slaughter animals.

The experience of many farms in the RSFSR, Ukraine, Moldavia, Kazakhstan, and other republics of the country illustrates that where the raising and feeding out of cattle is well organized it is entirely realistic to expect the weight at sale to rise to 450 kilograms and more. For example, the average live weight of cattle sold for slaughter from farms in Kurganskaya, Chelyabinskaya, Penzenskaya, and Orenburgskaya oblasts in recent years has been over 400 kilograms. At the same time, farms in Ivanovskaya, Kalininskaya, Yaroslavskaya, and certain other oblasts are selling cattle at a live weight of 300-315 kilograms. Under fairly difficult conditions the farms of Kirovskaya Oblast have achieved a much higher selling weight of 370-375 kilograms. The kolkhozes and sovkhozes of the North Caucasus region of the RSFSR and many farms in Kirgizia, Armenia, Georgia and elsewhere are selling cattle at low weights. For the country as a whole, only 34 percent of the cattle coming from the kolkhozes and sovkhozes have good weights.

Unfortunately, the aspiration of particular farms to increase the weight of livestock is often accomplished, as noted above, by extending the time of raising and feeding out while achieving only low daily weight gains. This in turn leads to overexpenditure of feed and inefficient use of material-technical means and labor resources. According to available calculations, the raising and feeding out time for cattle was reduced by 60 days between 1975 and 1978 and now averages 750 days, with variation among farms of the different Union republics from 620 in Lithuania to 1,230 days in Uzbekistan.

At the same time, the experience of individual farms shows that its is possible to achieve higher indicators while reducing the raising and feeding out time. For example, the Dubrovskiy Sovkhoz in Chelyabinskaya Oblast got an overage daily gain of live weight of 1,000 grams a head with its handling capacities fully loaded (10,000 head at one time). The farm sold young cattle averaging 471 kilograms at an age of 14-15 months. The Mayak Interfarm Enterprise of Liskinskiy Rayon of Voronezhskaya Oblast got the same average daily gain. The animal husbandry workers of the Mir Complex in Brestskaya Oblast achieved even high indicators. Their average daily gain in

1979 was 1,088 grams with expenditures of 5.5 quintals of feed units per quintal of live weight gain.

Experience shows that livestock potential is poorly used mainly in the post-weaning period, that is at ages of more than four months. In this period the animals often do not receive the needed feed, digest available feeds poorly, and fall behind in their development. Violation of proper cattle raising procedures is one of the most common problems; eliminating these violations would permit a significant improvement in the production and economic indicators of the sector.

This requires the establishment of a uniform, continuous production cycle for raising and feeding out livestock. Thus, after the transition to receiving unweaned calves and introduction of continuous procedures for raising and feeding out specialists at the Shchigry Complex for raising and feeding out cattle in Kurskaya Oblast began selling cattle to the state at 15-18 months of age with an average live weight of 450 kilograms. In 1979 the average age of young cattle sold for slaughter in the RSFSR was 24 months. At the same time, the RSFSR Skotoprom [Livestock Industry] system sells them at 18 months for the most part, and cattle raising complexes sell them at 16 months. Moreover, the average live weight of cattle sold by the complexes is 80-100 kilograms more. For example, the Druzhba Complex in Vologodskaya Oblast received calves averaging 47 kilograms in weight from the kolkhozes and sovkhozes in 1979 and after raising and feeding out sold them at an average of 464 kilograms, getting a daily live weight gain of 1,037 grams per head. The Veludskiy Complex in Belgorodskaya Oblast has achieved good results. The farm sells young animals averaging 434 kilograms at 15-16 months of age. Their daily weight gain was 1,022 grams. The transition to continuous, intensive procedures for raising and feeding out cattle is entirely realistic. It can be accomplished at all farms, particularly specialized ones.

A number of regions of the country have accumulated rich experience with solving these problems on an interfarm basis. Farms in Belorussia, the Ukraine, and Moldavia, and in many oblasts, krays, and autonomous republics of the RSFSR have taken the path of combining production. Alongside the kolkhozes, sovkhozes are playing a growing role in the development of interfarm cooperation. For example, the sovkhozes of Skotoprom account for more than 15 percent of the total live weight gain of cattle in the RSFSR. About 800 sovkhozes of this system are operating as interfarm enterprises to raise and feed out cattle.

The organizational forms of activity by such farms are constantly being refined, and the number of participants in cooperation is growing. More than 10,000 farms today are directly involved with the work of the Skotoprom sovkhozes of the RSFSR. The Skotoprom sovkhozes of

Kurskaya Oblast have accumulated very good experience. With the support of local party, Soviet, and economic agencies they are constantly improving their production and economic indicators. A unified system, Kuban'myasoprom [Kuban' Meat Industry], has been set up in Krasnodarskiy Kray on the basis of specialized kolkhozes, sovkhozes, and interfarm enterprises. The enterprises of this system organize all work related to raising and feeding out cattle and feed production; most of them enjoy good reputations with the neighboring kolkhozes and sovkhozes and achieve good indicators. The example of the farms of Kuban'myasoprom is a graphic demonstration of the benefits of specialization and concentration of agricultural production.

Krasnodarskiy Kray has moved boldly forward with the establishment of specialized feed production brigades and farms, allocating areas for feed production, and supplying the full feed requirements of the livestock farms and complexes. Experience shows that this approach works out very well. Many farms of Kuban'myasoprom are switching to receiving young calves from the kolkhozes and sovkhozes and setting up a unified production cycle for raising and feeding out the cattle.

Until very recently work to introduce this technology was held back by a shortage of starter feeds and milk substitutes. A significant increase in the production of whole milk substitutes is envisioned in the near future. Workers of the meat and dairy industry have a large part in solving this important problem. Capacities for production of regenerated milk are also expanding significantly in the country. This opens up broad opportunities for introducing intensive methods and procedures for raising cattle and increasing beef production on this basis. The main thing now is to see that every kolkhoz and sovkhoz works out and implements measures to intensify this sector and achieves an increase in beef production by raising productivity.

Hog raising will be very important in increasing meat production in the coming years. Pork accounts for at least one-third of the total volume of meat production in the country. In recent years a great deal has been done toward development of this sector; it is being switched to an industrial basis at an accelerated rate. About 30 percent of the pork sold to the state today already comes from large complexes and mechanized livestock farms. The figures in Table 2 (next page) illustrate the changes that have taken place in hog raising.

The decisive part in reducing feed expenditures per unit of output in this sector was played by improving the balance of feeds consumed by increasing the proportion of concentrated feeds, above all by greater use of mixed feeds. The share of mixed feeds in total use of concentrated feeds in hog raising rose from 22 percent in 1962 to 44 percent in 1978. At the same time, certainly, the processes of concentration and specialization also had a beneficial effect on the development of hog raising.

Table 2. Indicators of the Development of Hog Raising in the Public Sector

	1966-1970	1971-1975	1976-1979	1971-1975 as % of 1966-1970	1976-1979 as % of 1971-1975
	Average by Year				
Millions of Hogs	56.3	53.9	56.2	95.7	104.3
Pork Production, Live Weight, thousands of tons	3,406.0	4,419.0	4,341.0	129.7	98.2
Total Feed Used, millions of tons of feed units	30.4	38.4	36.6*	126.3	95.3
In Above, Concentrated Feeds	23.4	31.1	30.4*	132.9	97.7
Feed Used per Quintal of Live Weight Gain, quintals of feed units	9.39	8.98	8.53*	95.6	95.0
In Above, Concentrated Feeds	7.14	7.26	7.03*	101.6	96.8

* Average for 1976-1978

It should be remarked, however, that the possibilities for further development of pork production are far from exhausted. This is shown, in particular, by a comparison of the indicators of development of hog raising for particular republics. For example, the average live weight gain of hogs at farms of the Estonian SSR in recent years has been 40 percent higher than the national average. Direct labor expenditures per quintal of live weight gain at kolkhozes in Estonia are just two-sevenths of the national average, while at kolkhozes they are half. The prime cost of a quintal of live weight gain in hogs is just 70 percent of the average for the country. It takes Estonian farms less than 300 days to bring a hog to a selling weight of 105-106 kilograms, while the average for kolkhozes and sovkhozes in the country is 450-460 days.

The potential of hog raising began to show itself graphically with transition of the sector to an industrial basis. There are now 488 hog raising complexes in the country. The average daily live weight gain at them is 50 percent greater than indicators for kolkhoz and sovkhoz livestock farms, while the expenditure of feed is considerably lower. It should be emphasized, however, that success in increasing meat production is determined today and for a long time into the future will still be determined by the kolkhoz and sovkhoz livestock units. Therefore, it is very important to strive for an improvement in the production indicators at all agricultural enterprises.

Poultry raising has great potential for boosting meat resources. In the 11th Five-Year Plan the share of poultry meat in total meat production will rise significantly, doubling and tripling in certain regions. This will be promoted by carrying out the decree of the CPSU Central Committee and USSR Council of Ministers entitled "Measures To Increase the Production of Poultry Meat." Already today more than 80 percent of the poultry meat is produced on an industrial basis, at enterprises and associations of USSR Ptitseprom [Poultry Industry]. At the same time it should not be forgotten that building meat production at private auxiliary farms and at the kolkhozes and sovkhozes, with USSR Ptitseprom playing a managing and organizing role, is an important reserve.

The size of the sheep herd will be increased in the 11th Five-Year Plan, which will provide the basis for growth in mutton production. Mutton today accounts for about seven percent of total meat production, and this proportion will be maintained in the future. As is presently the case, most of the meat and wool is to be received from pasture feed, but at the same time there will be intensification of the sector, particularly in the central rayons of the RSFSR, the Ukraine, Belorussia, and the Baltic republics. A broad program of steps to develop sheep raising has been outlined for Kazakhstan and Kirgizia.

The challenges that have been set for increasing meat production in the 11th Five-Year Plan can only be met if there is fuller use of all reserves in all sectors of animal husbandry, in all regions of the country.

In the coming five-year plan animal husbandry will be developed at an accelerated rate in both the traditional regions and in Siberia, the Far East, Central Asia, and Transcaucasia, where there are broad opportunities for using natural feed lands. For example, farms in Tashkentskaya Oblast of Uzbekistan have achieved high indicators in animal husbandry in recent years. They fulfilled the assignments of the first four years of the five-year plan for all indicators and raised meat sales to the state by 18 percent in 1979 alone. They have taken on the obligation of raising meat production by 25 percent in 1980. Their success has been largely determined by a high level of organizational work and the purposefulness of party, Soviet, and economic agencies in using reserves and potential for increasing meat production. Many farms in the oblast receive 200 quintals and more of outstanding alfalfa hay per hectare of irrigated land.

Monitoring fulfillment of assignments each month, objective evaluation of the results of labor, precisely organized socialist competition, broad dissemination of progressive practices, and wide use of intensive methods of managing animal husbandry in practice -- these are the components of their success. Taking progressive know-how as a guideline, the CPSU Central Committee and the USSR Council of Ministers adopted a special decree, "Steps To Accelerate the Development of Animal Husbandry in the Uzbek SSR," which outlines high goals for the development of animal husbandry in this republic in the 11th Five-Year Plan.

The forthcoming five-year plan will be decisive in stepping up the rate of development of animal husbandry. The challenge of almost completely supplying the population of our country with meat and meat products can be essentially answered in the coming decade if we can attain the assigned growth rates for meat production and then maintain them.

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LIVESTOCK

DIRECTIONS OF MEAT PRODUCTION DEVELOPMENT REPORTED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 80 pp 29-32

[Article by N. Knyazev: "Directions of Meat Production Development"]

[Text] For the country as a whole, average annual meat production during the first four years of the 10th Five-Year Plan has been 14.8 million tons, as against 14 million tons in the Ninth Five-Year Plan and 11.6 million tons in the Eighth. Average annual meat production on kolkhozes and sovkhozes has exceeded the level of the Ninth Five-Year Plan by 10 percent. The production of poultry and beef has increased at the highest rate.

At the same time, the rates of meat production increase have not corresponded to the tasks facing agriculture. The rates of meat production increase must be speeded up, as was insistently stressed at the July (1978) CPSU Central Committee Plenum.

A comparatively steady trend towards increasing livestock and poultry productivity has been noted in the country's stockraising development.

The increase in livestock output production in the Ninth Five-Year Plan was provided through increase in the number of head (63.6 percent) and through increased productivity (36.4 percent); the corresponding figures in the 10th Five-Year Plan were 72.9 and 27.1 percent. Thus, the increment in stockraising output has come basically through the increased number of head.

Livestock meat productiveness on kolkhozes and sovkhozes during the indicated period increased insignificantly. Live weight per head of cattle released to the state increased from 304 to 331 kg during this period; per hog, it decreased from 102 to 97 kg, and per sheep -- from 36 to 34 kg. However, the increase in cattle market weight came not from intensification of beef production, but as a result of holding the cattle too long. This is borne out by the significant reduction in the proportion of cows in the herd, given relatively stable daily weight gains.

The low level of productiveness results basically from the inadequate feed base. Sovkhoz and kolkhoz stockraising is being developed given a feed shortage, with feed production plans not being met year after year. As the experience of the country's leading farms and foreign practice show, each conventional head of cattle needs 40-45 quintals of fodder units. In fact, however, cattle were actually fed 25.1 quintals in the Eighth Five-Year Plan, 26.3 quintals in the Ninth, and 27.4 quintals thus far in the 10th. Thus, the feed level rose only 4.8 percent in the Ninth Five-Year Plan and 4.1 percent in the 10th. Livestock productiveness rose correspondingly.

Another substantial shortcoming in the fodder base is the poor quality of grass feed and significant losses of grass feed nutrients during procurement and storage. Thus, the RSFSR procured only 21 percent of its hay as first-grade and 20 percent as second-grade in 1977; the figures were 11 and 25 percent, respectively, for haylage. Thus, more than half the grass feed procured was of poor quality.

A third fodder base shortcoming is the shortage of mixed feeds and protein-vitamin concentrates. Of the 145.9 million tons of concentrated feed fed to livestock in 1978, only 56.9 million tons, or 39 percent, was mixed feed. At the same time, each quintal of mixed feed used provides 3-4 kg more meat as compared to forage grain.

The comparison of feed expenditures and productiveness on ordinary farms and complexes given in Table 1 testifies graphically to the potential for increasing livestock productiveness by improving feed quality.

Table 1. Feed and Productiveness (per feed-day, 1978)

	young beef cattle				hogs			
	feed-unit expenditure		weight gain (in grams)		feed-unit expenditure		weight gain (in grams)	
	sovkhozes	complexes	sovkhozes	complexes	sovkhozes	complexes	sovkhozes	complexes
USSR	5.2	5.6	397	624	2.4	2.3	290	372
RSFSR	5.7	5.9	401	671	2.3	2.3	293	374
Ukrainian SSR	6.4	5.2	364	545	2.2	2.3	265	353
Belorussian SSR	4.9	5.9	430	838	2.6	2.5	309	456
Estonian SSR	4.3	--	473	--	2.2	2.4	365	469
Armenian SSR	3.7	5.2	280	597	2.5	2.5	262	305
Azerbaijan SSR	3.2	--	213	--	4.3	2.4	282	374
Uzbek SSR	2.4	4.1	234	555	--	--	--	--
Turkmen SSR	6.4	6.0	292	393	2.9	3.0	260	320

Nearly the same amount of feed is used per feed-day on both sovkhoz farms and complexes to raise hogs, but weight gains at the complexes are 30-35 percent higher. One of the main reasons is that the complexes basically use mixed feed, while the sovkhoz farms use a high proportion of simple grain mixtures.

The same thing happens in raising young beef. Sovkhoz farms and complexes use nearly identical amounts of feed, but the differences in feed quality result in 30-percent higher meat productiveness on the complexes. In the Transcaucasus and Central Asian republics, the poor feed quality on ordinary farms is accompanied by obvious underfeeding, also resulting in low productiveness.

As a result, 920 days is required to achieve a weight of 400 kg in young beef on sovkhoz farms, 375 days to reach 110 kg in the case of hogs. The time needed is two-fold less on complexes.

The country's meat balance is shaped basically in two branches, livestock raising and hog raising. Poor harvest years generally are felt foremost in hog raising, as the number of head and pork production fall. Under these conditions, the meat produced changes sharply in structure, as the proportion of beef increases and pork production decreases correspondingly. At the same time, a comparison of expenditures on meat production by type of output shows that 2-3 times less feed and labor is spent on poultry (especially broiler) meat and pork production than on beef and mutton.

It is known that grains are the primary feed in hog and poultry raising. Thus, the proportion of concentrates in hog rations on the country's sovkhozes is 86 percent, with fluctuations by zone from 72 percent in the Belorussian SSR and the Volgo-Vyatskiy economic region of the RSFSR to 99 percent in the Georgian SSR; in poultry raising -- 98 percent, with fluctuations from 94 to 100 percent. At the same time, the proportion of concentrates is 28 percent in beef raising (fluctuations -- 18 to 37 percent) and 17.1 percent in sheep raising, with fluctuations from six to 29 percent.

However, in order to make a comparative economic evaluation of meat production effectiveness by type of output, we need to record not only concentrates, but also the entire aggregate of feeds grown on plowed land. Based on the actual fodder crop yields and the actual level of stockraising intensiveness, we determined the actual plowed-field requirements to produce the feed necessary for one quintal of different types of meat. These calculations showed that, in spite of the presence of natural fodder lands and the use of straw in rations, more plowed land is required to produce a quintal of beef than to produce a quintal of pork in a majority of the farming zones. This difference is especially appreciable in the steppe grain-producing republics and regions. Exceptions are the Transcaucasian and several Central Asian republics and the Central, Northern Caucasus and Volga regions of the Russian Federation, where the high proportion of natural fodder land permits making do with somewhat less feed produced on plowed fields.

The relationship which has evolved in the demand for plowed land to produce a quintal of meat results from the relatively low fodder crop yields -- grasses, silage crops, root and vegetable crops -- as compared with grain forage crop yields. On average for the country, grain forage crops yield 1.4-fold more feed than fodder crops, including 1.7-fold more in the Central Chernozem region, 1.5-fold more in the Volga region, and 1.6- to 1.7-fold more in the Baltic region. This relationship changes only in the cotton-growing republics, where fodder crops (alfalfa, root and vegetable crops) are cultivated on irrigated land, and grain crops are cultivated on fallow land.

Stockraising intensification and the transfer of its branches to an industrial basis will lead to a reduction in feed expenditures per quintal of meat. At present, both the proportion and the absolute expenditure of concentrates are higher for beef and mutton production. Whereas 21.6 quintals of fodder units, including 5.9 quintals of concentrate fodder units, was spent per quintal of slaughter-weight beef on sovkhozes in 1978, feed expenditures were 15 quintals of fodder units at livestock feed lots and concentrates expenditures had increased to 6.4 quintals of fodder units. The situation is also similar in industrial-base mutton production. As a result, concentrates expenditures per quintal of pork equalled or were only somewhat higher than expenditures per quintal of mutton. On the country's best hog-raising complexes, they dropped to six quintals of fodder units, which is lower than at beef complexes like the "Voronovo" in Moscow Oblast, where 7.0 to 7.3 quintals of fodder-unit concentrates are spent per quintal of beef.

Thus, from the viewpoint of using fodder, labor and capital investments efficiently in stockraising, it is appropriate to increase poultry and pork production faster.

Cost appraisal of meat production using sovkhoz data for 1978 also demonstrates certain advantages to broiler and hog production (Table 2).

Table 2. Economic Effectiveness of Meat Production on Sovkhozes

	output (in rubles)		profit (in rubles)		profitability level
	per quintal of fodder units	per ruble of feed cost	per quintal of output marketed	per ruble of feed cost	
beef	19.8	2.15	12.2	0.15	7.6
pork	24.8	1.91	14.0	0.16	9.4
poultry meat	31.3	1.77	7.3	0.06	3.8
incl. broilers*	50.1	2.60	90.2	1.12	75.1
mutton	13.2	3.67	- 4.6	-0.16	- 4.2

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*farms of the RSFSR Administration of the Poultry Raising Industry

Thus, given the existing price and expenditures mechanism, pork and broiler production is being stimulated.

Reserves for increasing meat production are to be found elsewhere besides changing the output structure. They are also associated with improving the directions in which individual branches are being developed. For example, differing amounts of beef can be produced given the exact same feed resources and material-technical means in meat-dairy and specialized meat stockraising. This is a complex problem and one directly connected with milk production, cow milk productiveness and beef meat productiveness.

The necessary amount of milk can be produced with a greater or lesser number of dairy cows, depending on their productiveness. At the same time, the number of head of young beef obtained in dairy stockraising decreases correspondingly as cow productiveness in meeting the country's milk needs increases, necessitating an increase in the proportion of specialized meat stockraising. In this regard, it should be borne in mind that material-technical and labor expenditures on beef production differ in meat-dairy and in specialized meat stockraising. Whereas feed expenditures per quintal of weight gain in the former are 7-8 quintals of fodder units, they are 14-15 quintals in the second. Therefore, as meat production in specialized meat stockraising increases, the overall demand for feed to produce beef increases substantially. On the other hand, intensifying dairy stockraising leads to a reduction in the demand for feed for milk production.

Calculations show that the total demand for feed for milk and meat is still growing, although insignificantly, as the milk productiveness of cows increases and the proportion of beef obtained from dairy cows decreases and the proportion obtained from specialized meat stockraising grows correspondingly (Table 3).

Table 3. Demand for Feed for Stockraising, Given the Production of 92 Million Tons of Milk and 7.4 Million Tons of Beef (in million tons of fodder units)

	feed demand given different yields per cow				
average daily beef weight gain (in grams)	2,500 kg	3,000 kg	3,500 kg	4,000 kg	4,500 kg
400	252.8	262.6	267.2	269.7	270.8
600	221.3	223.7	229.6	233.1	234.9
700	--	213.0	216.2	219.5	221.1
800	--	--	206.0	210.4	211.9

As cow productiveness increases from 2,500 kg to 4,500 kg, the demand for feed to produce the calculated quantity of milk (92 million tons) decreases from 118 to 98 million tons of fodder units, that is, by 20 million tons of fodder units. At the same time, feed expenditures to produce 7.4 million tons of beef, given an average daily weight gain of 400 grams, increases from 135 to 172 million tons of fodder units, or by 37 million tons, due to the intensified development of specialized meat stockraising. Given an average daily weight gain of 600 grams, this increase is 33.6 million tons of fodder units, that is, more than the savings obtained in dairy stockraising by increasing cow milk productiveness.

As is evident from these calculations, the decisive factor in lowering feed expenditures to produce a prescribed amount of milk and beef will be the intensification of beef production in meat-dairy and dairy stockraising and increasing beef live weight to 450 kg or more.

In terms of union republics and economic regions, the output structure of meat production has evolved under the influence of a number of economic and natural factors, as well as traditions among the population. In this regard, the role of branches with a dual productiveness -- dairy stockraising and poultry raising, where meat is a by-product of the production of the needed amount of milk and eggs, is great.

At present, about 25 percent of the beef being produced is provided by culling dairy cows, and meat-dairy stockraising supplies 97 percent of the beef.

In poultry raising, 53 percent of the meat is provided by culled layers. If we add to this the mutton obtained as a by-product of wool production, then it turns out that the proportion of meat obtained as a by-product reaches 57 percent, and 60-70 percent in Central Asian and Transcaucasian republics. Therefore, the opportunities for increasing meat production by changing the output structure are very limited. The branch structure of stockraising must be oriented towards maximum use of existing resources in each region and must as a whole facilitate increasing the production of stockraising output on the basis of intensification.

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REGIONAL DEVELOPMENT

HOUSING NEEDS OF RURAL POPULATION CONSIDERED VERY IMPORTANT

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 7, Jul 80 pp 54-58

[Article by Vil'mar Manfredovich Stern, candidate of economic sciences, docent at the Chair of Economics and Organization of Construction, Moscow Architectural Institute: "Housing Construction in the Countryside"]

[Text] At the present time, the quickest possible satisfaction of the housing needs of the rural population is of important significance. The rate and structure of housing construction depends on economic, social-economic, demographic, technical and organizational conditions.

Architectural-construction and technical policy in the field of rural housing construction for the immediate future is determined by the "List of Types of Dwelling Houses for State, Kolkhoz, Cooperative and Individual Construction in a Rural Locality." On the basis of consideration of determining factors, there have been included in the list recommended types of dwelling houses, differing as to character of residence, types and number of stories, their volumetric and planning structure, length, types of dwellings and conditions of their settlement. The list is differentiated as to climatic regions; it is based on the principle of providing each family a separate dwelling with the number of rooms varying from one to six.

In determining ways of improving the efficiency of rural housing construction, there should be taken into account the special features of both the projects and the process of construction: the existence of two forms of socialist ownership, the spatial distribution of the projects, the isolation of most projects from a network of well-built roads, the relatively small volume of work at each location, the remoteness of locations from bases of the construction industry (which affects the conditions of the circulation of the means of production in construction, the possibilities of using in small-storied buildings materials with small bearing capacity and fulfillment of a considerable volume of work by the economic methods and also by the forces of the population. The noted features are responsible for significant regional fluctuations of socially necessary outlays of labor and estimated cost of construction in connection with differences in prices for local resources, in transportation expenditures, conditions of labor pay (connected with the traveling character of the work, winter price increases and so on), in forms of construction organization and, moreover, due to differences in volumetric-planning and design solutions of dwelling houses and their sanitary engineering equipment.

Rural housing construction provides for the consideration of social-economic conditions of the life of the population and regional features. For example, the northern construction-climatic zone is characterized by joint location of farm structures with a dwelling house (under a single roof), covered passageways between separate buildings, absence of summer quarters, reduced size of the area attached to the dwelling and so forth. Under southern conditions (climatic region IV), the dwelling area may include a summer kitchen in the vicinity of the house--a "green" room, an open water body--and so on.

At the July (1978) Plenum of the CPSU Central Committee, Comrade L.I. Brezhnev noted: "Clearly, rural construction should be oriented to provide families, as a rule, with separate well-appointed houses with individual plots...

"It is very important to provide for the development of individual and cooperative housing construction with attraction of the funds [sredstva] of the rural population."[1]

The orientation toward state housing in multidwelling houses does not stimulate the maintenance of a subsidiary private farm and limits the family budget, which narrows down the possibilities of acquiring a house with rights of private ownership. Thus, in a number of republics during the Ninth Five-Year Plan (as compared to the Eighth), the produce produced on subsidiary private farms was reduced 8-11 percent; in Moscow Oblast, for example, production of milk, meat, eggs, potatoes and vegetables on private subsidiary farms during 1971-1977 was reduced by approximately one-quarter. Such a tendency was due to the reduction of the size of the rural population, the influence of urbanization, a change in the social-psychological orientation of the residents and so forth. In this connection, it is very important that the conditions of resettling families in these or those types of houses do not restrain the development of subsidiary private farms, which play at the present stage an economic and social role of no small importance.[2] Thus, selective surveys show that the sizes of subsidiary private farms, as a rule, do not depend on the size of family income from public production but rather depend on the type of house. Those living in sectional dwelling houses are usually engaged in private farming on a smaller scale than those living in individual houses (given the same numerical and age makeup, social position and education of the family members).

For the settlement of rural families, as shown by sociological surveys, the most convenient houses in terms of their planning structure and connection to a plot of land and broad possibilities of operation of subsidiary private farms are block houses of one or two stories or a mansard roof.

In the period since 1965 dwelling houses have been built with a total area of approximately half a billion square meters,[3] that is, practically one-third of rural families have improved their housing conditions. At the present time, the housing fund on the average is no smaller for a rural inhabitant than it is for a city dweller. Total area in 1976 reached 12.3 square meters;[4] in 1980 it amounted to 13.3 square meters.

Distribution of the housing fund on the basis of sources of financing is characterized by the predominance of individual houses (more than 80 percent). In 1977, of the introduced houses with a total floorspace of 36.7 million square meters, the share of state and cooperative organizations amounted to 43.6 percent, kolkhozes and kolkhoz members--39.4 percent, workers and employees who had built houses on their own account and with the help of state credit--17 percent.[5]

In the past ten years, the volume of state and kolkhoz construction of dwellings increased, and the level of their amenities was higher. At the same time, the volume of individual construction was curtailed, which resulted in the underfulfillment of the program of commissioning of rural dwellings. Thus, the total volume of commissioning of the housing fund in the countryside in the Ninth Five-Year Plan was 167.4 million square meters, whereas in the Eighth the figure was 183 million square meters, that is, it dropped 8.3 percent as the result of curtailment of almost one-third of the volume of individual construction. This tendency is also characteristic of the present five-year plan.

The development of individual construction is being restrained by a number of factors. These, in our view, consist of an inadequate material-technical base for small-storied house construction, limitation of construction materials, paid for from noncentralized sources of financing and also released by builders through the trade network, inadequate aid to them on the part of sovkhozes and kolkhozes (in procurement and production of local materials, making transport, machines and mechanisms available in the production of construction work). The estimated cost of individual houses is high and consequently monthly payments in defrayal of credit are considerable.

In rural localities only one-fifth of the better appointed state housing fund has complete engineering equipment: water supply, severage, heat and gas supply. The housing fund of kolkhozes is characterized by a lower level of equipment; the overwhelming majority of houses have only elementary conveniences.

The structure of the introduced fund is characterized by a significant predominance of one- and two-story houses. But in industrial oblast, the volume of four- and even five-story houses in 1977 was significant. For example, in Moscow Oblast 58 percent of the housing fund consisted of five-story houses in 1977. Distribution of houses according to types of design is characterized by an insignificant number of completely prefabricated buildings: the share of precast large-panel and large-block houses amounts to slightly more than 20 percent; the rest of the houses are made of local (small-size) materials and lumber.

Table. Provision of Housing Fund for the Rural Population

	Years				
	1970	1975	1980	1980	2000
Rural population, millions of persons	104.9	98.9	96.0	92.5	89
Share of rural population in total population, %	43.0	38.6	36.0	32.0	28
Rural housing fund, millions of square meters	1,160.0	1,205.0	1,282.0	1,431.0	1,610
Housing fund provision, square meters	11.0	12.2	13.3	15.5	18
Annual commissioning of dwelling houses, millions of square meters	34.7	33.6	35.6	43.0	50

Data on the need of introduction of housing in the countryside is presented for all sources of financing in the above table.[6]

As shown by calculations, the provision of the rural population with a housing fund in the size of 18 square meters per person (official goal norm) will require building houses with a total floorspace of 900 million square meters. More than 60 percent of this volume will is for the reproduction of the decommissioned fund and 350 million square meters constitute the net growth.

Capital-investment volume in this connection increases to a large extent because of the rise of the index of estimated cost of housing.

The index of estimated cost of dwelling houses in the contryside grew 16 points in the Ninth Five-Year Plan compared to the Eighth as an average; in the RSFSR the figure was 15 points.[7] This is to be explained as a rise of the wage level in construction and of prices for certain materials and also by significant improvement in the comfort of rural housing.

It should be kept in mind that the effect of cost-increasing factors such as greater convneiences and hygienic qualities of dwellings, level of amenities, finishing and equipment and in addition the rise in the cost of power and raw materials, particularly manufactured construction materials, will exceed the size of a possible reduction of estimated cost of dwellings stemming from "cost-reducing factors" (boosting of the level of prefabrication and industrial preparation of components, higher labor productivity in construction, introduction of light progressive materials and components and so on). If the tendency of curtailment of the volume of individual construction in the countryside is not halted, then the growth rate of state (and kolkhoz) capital investment in this sphere will to a large extent exceed the growth rate of the housing fund.

With an estimated cost of one square meter of floorspace, which by the year 2000 will reach according to our calculations an average of 210-220 rubles for the country (in 1976 it amounted to 179 rubles), the value of the annually introduced housing fund in the countryside will be expressed by the end of the forecast period in an amount of 10.5-11.0 billion rubles, that is, it will almost be doubled. The accomplishment of such a program, even with a steady rise in labor productivity in construction, would require bringing in additional hundreds of thousands of workers. Subsequent operation of the rural public housing fund (repairs, maintenance of engineering-systems equipment, places of general use) is possible only under the condition of bringing in into the sphere of housing and municipal services in the countryside a no smaller number of workers.

Given the conditions of a dynamic development of the national economy and changes in its sectorial and territorial structures, there is a particularly acute problem of coordinating the development of material production and of the nonproduction sphere with the existence of labor resources.

It was noted at the 25th CPSU Congress that the "balanced development of the national economy must also be ensured to a significant degree by a rational policy of capital investment and a decisive improvement in all construction work."[8] There have been directed toward this measures that are being implemented for improving planned management of the economy as provided by the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Action of the Economic Mechanism on Raising Efficiency of Production and Quality of Work" (July 1979) and also "On Further Developing the Construction of Individual Dwelling Houses and Securing Cadres in the Countryside" (June 1978).

On the basis of directives worked out by the party, it is necessary to disclose existing reserves and to find ways of boosting the effectiveness of capital investment and optimal use of labor and material resources. Maximum utilization of the advantages of small-storied construction should be at the basis of adopted decisions.

With existence of roads and means of delivery, as well as a developed base of industrial house construction, it becomes feasible to build large-panel (a panel per room or wall of house) or volumetric-block houses (a block in the form of a ready room or dwelling) made from light components. The level of plant readiness in the first instance exceeds 50 percent and in the second--85 percent. In these designs sheet and slab materials of small mass and with effective heating, multilayer elements faced with a water-resistant plywood, asbestos-cement sheets, pressed and reinforced slabs and so on.

Because of chemical treatment, materials retain form and durability. In terms of water-, fire- and frost-resistance they do not yield to stone components.

Prefabricated wooden house construction presents broad possibilities. World practice of wooden plant house construction attests to the fact that at the present level of development, it is most economical. This is due to the high level of use of wooden dwelling houses in the United States (60 percent), Canada (50 percent), as well as in Scandinavian countries. The total (plant plus installation) labor intensiveness of construction of wooden houses (without a null cycle) amounts to only 3-5 man-hours per square meter of floorspace, that is, it is one-third to one-fourth that of construction of a prefabricated ferroconcrete house. The lightness of such structures ensures efficiency of their transportation over any distances.[9] Thanks to flow-conveyor technology, a plant may put out 15-25 types of houses (one-story, two-story, mansard, with different plans and number of rooms). For the fulfillment of the designated program of wooden house construction, it is enough to establish several large combines equipped with modern equipment.

In the decree of the CPSU Central Committee and the USSR Council of Ministers "On Further Developing Plant Production of Wooden Panel Houses and Sets of Components for Houses with Walls of Local Materials for Rural Housing Construction," it is pointed out that a number of ministries and installation construction organization are to provide for production of wooden houses of plant fabrication by 1985 of up to 7.1 million square meters and by 1990 of up to 11 million square meters of floorspace per year.

Of the synthetic stone materials, cellular concrete made with lime or Portland cement as a base is practicable. Its volumetric mass is almost one half that of the widespread light-weight aggregate concrete.

Because of the remoteness of rural villages from construction-industry bases, local materials as before must be widely used. In timber surplus regions, these would include first and foremost commercial lumber used for log and square-beam walls, shaped lumber--for framework-panel building. Timber procurement ways and conditions for sovkhozes and kolkhozes as well as citizens in forests of various groups are determined by the "Fundamentals of Forestry Legislation of the USSR and Union Republics."

Southern regions with a relatively dry climate characteristically use adobe. It has a low coefficient of heat conductivity, which contributes to economy of fuel in the use of a house. The hygienic and esthetic qualities of an adobe house may be enhanced by the use of modern finishing and facing materials.

In the Transcaucasus republics natural stone materials will be used as before; in the North Caucasus, Ukraine and Moldavia, hewn limestone and the like are employed. Brick made from local clays and earth can be used with benefit almost everywhere. In most cases brick houses are cheaper than those made of other materials. The reduction of labor outlays is possible through the replacement of traditional laying by vibro-brick [vibrokirpichnyye] blocks and panels produced by plants. The transition to industrial brick components compared to construction using individual bricks will make it possible to reduce per square meter of wall the labor intensiveness of work at a construction site by a factor of 7.5, total labor intensiveness (including plant outlays) by a factor of 3.8 and estimated cost of building a house by 20 percent.

Mention should be made of the possibility of building houses in the countryside of monolithic concrete erected in industrial molds with the employment of the most elementary machines and mechanisms on the site. Of advantage here are insignificant expenditures and lower requirements on the quality of roads, since dry mixtures and forms that can be assembled and disassembled are delivered to the sight.

In estimating the volume of forthcoming commissioning of dwellings, it is necessary to point out the following features.

The biggest bottlenecks in the outlined program include a shortage of labor resources and also the difficulty of using producer goods of contracting construction organizations and the need of utilizing these goods on considerable territories with a low volume of work at each construction site. Under such conditions the contracting method of work is far from always beneficial.[10]

Sixty percent of the forthcoming volume of housing construction in the countryside will be needed as compensation for the retiring fund (because of dilapidation, resettlement from small villages to sovkhoz and kolkhoz settlements and the like). More than 80 percent of this fund consists of individual houses owned by the population.

Under the specific conditions of the countryside, it is feasible to employ the considerable reserves of labor, which can be used in the construction of dwellings "for oneself" (without detriment to other sectors), to involve in this connection the park of machines and mechanisms of sovkhozes and kolkhozes and to utilize local resources. We know that the dependence of agricultural production on natural factors, even under conditions of comprehensive mechanization, does not permit overcoming the seasonal character of labor. Thus, seasonal fluctuations of labor (in percent of the average annual level) amount to 71-123 percent on vegetable-raising farms, 45-192 percent on cottongrowing farms and in contrast 91-109 percent on poultry factories. On the whole, at kolkhozes outlays of labor on farming from November to April constitute 30 percent of the yearly fund of time. Correspondingly, the machine park and means of motor transport, power and working machines, earth-digging equipment, trucks and also the capacities of the construction unit: wooden frames, truck cranes, electric jointing planes and so on are not fully used. Many types of construction work are successfully carried out in the late-fall and early-spring periods, and family members can take part in construction work practically the whole year around.

The noted factors permit making a conclusion on the effectiveness of an all-out orientation of construction policy toward activation of self-help construction. If it be considered that in the next 20 years there will be required to commission 45 million square meters of floorspace per year, or 0.6 million dwelling units (apartments, one-family houses), the available reserve of labor in the countryside used in the construction (assembly) of houses for oneself can ensure the fulfillment of the outlined program.

Naturally, directive forms of management are not feasible in the development of self-help construction. Realization of the program must center on the motivation of rural families, realization of the benefits which they receive in using the assistance of the state, the cost-accounting enterprise, collective of builders (housing construction cooperative). It is practical to take into consideration the development of this trend in planning work, organizational and financial measures, construction policy, corresponding orientation of planning work and material-technical construction services on sovkhozes and kolkhozes.

It is possible to activate individual construction in regions with nonavailability of labor through grants of preferential credit to builders and provision of sets of construction materials and components for a house. At the same time, credit-payment monthly installments should insignificantly exceed rent payments in state apartments. Non-onerous conditions of credit (a practically non-increasing expanse portion of a family's budget) makes it possible to have a house with rights of private ownership, reduce the need and expenses of the family for the acquisition of a second dwelling in the form of a garden cottage on the plot and assist in the fitting out of a subsidiary private farm.

Experience shows that with preferential credit extension and material-technical support of independent construction many economic tasks, social measures were successfully resolved, attraction and securing of cadres have been achieved, villages have increased in size and so forth. Thus, when nationalities of the Far North assumed a settled way of life, the state paid 75 percent of the estimated cost of complete sets of stone houses supplied from Arkhangel'sk, including the cost of shipment by sea. In Lithuanian SSR, when inhabitants are being resettled from farmsteads to villages, half of the credit is paid by farms (on top of the payments for the structures left at the farmstead).

The experience of cooperative housing construction in the rural Druzhba ZhSK [Housing Construction Cooperative] organized on Nara Sovkhoz in Moscow Oblast. Whereas the sovkhoz in 1979 invited a contracting organization for construction of the first section of the first ten farmhouses, the subsequent buildings are planned to be built with their own efforts. The possibilities of preferential credit extension to the builders are being provided here particularly by the fact that in 1978 the sovkhoz received in connection with its basic activity almost one million rubles of profit, two-thirds of which went into the construction of the ZhSK.

In the future, it will be necessary to combine three basic directions: development of rural construction-industry enterprises in the form of combined production operations (house-construction combines with a complete cycle of of installation of construction products); development of specialized enterprises for the production of a limited products list of industrial products; and, finally, development of testing grounds and small enterprises for the production of materials and components from local resources using the economic method. Taking into account efficient production of wall materials on the basis of local resources, It is necessary to be oriented toward their use in combination with industrial products.

Technical supervision of independent construction may be assumed by specialists of the construction brigades of sovkhozes, kolkhozes and local structural units of the Ministry of Rural Construction and Mezhkolkhozstroy [All-Union Interkolkhoz Construction Organization (?)]. Firms for individual (cooperative) construction may act as independent units. Their functions will include both erecting a house and turning it over to the customer and also issuing a complete set of the necessary items to the builder for independent construction (assembly). It would be advantageous to have complex construction-planning firms obtaining their orders on a competitive basis.

In conclusion, the following conclusions may be made.

--It is necessary to have an all-out orientation toward the development of individual and cooperative construction with differentiation of preferential conditions of credit extension and material-technical support for builders depending on the acuteness of the problem of attracting and securing cadres. Over the long term, there will be allotted to the share of the individual housing fund (with its possible partial replacement by the cooperative) 50-70 percent on sovkhozes and 80-90 percent on kolkhozes.

--The development of a material-technical base for rural housing construction must be oriented toward low-storied houses and satisfaction of the needs of independent construction. For the simplest types of work and operations (earth work, foundation laying, installation of elements of buildings, finishing, provision of amenities on the territory and so on), it would be advantageous to bring in builders and also personnel of sovkhozes, kolkhozes and ZhSK collectives. It would be useful to have cooperation in housing construction through a combination of the contracting and economic methods of work and the involvement of equipment of agricultural enterprises.

--The design solution of small-storied dwelling houses in the countryside should combine in themselves maximal assembly of industrial components with the use of local materials. At the same time, there should be efforts to achieve lower material intensiveness of components and their mass and to provide the most simple methods of erecting buildings.

Thus we are dealing not only with the discovery and utilization of local reserves but also with the development of a comprehensive goal program for the development of rural housing construction for the long-term period.

FOOTNOTES

1. L.I. Brezhnev, "O dal'neyshim razvitii sel'skogo khozyaystva SSSR. Doklad na Plenume TsK KPSS 3 iyulya 1978 goda. Postanovleniye Plenuma TsK KPSS, prinyatoye 4 iyulya 1978 goda" [On the Further Development of Agriculture in the USSR. Address at the Plenum of the CPSU Central Committee Adopted 4 July 1978]. Moscow, Politizdat, 1978, p 40.

2. For example, in the combined budget of families of kolkhoz members, receipts from subsidiary private farms amount to about 25 percent ("Narodnoye khozyaystvo SSSR v 1977 g." [USSR National Economy in 1977]. Moscow, izd-vo "Statistika", 1978, p 410).

3. The newspaper PRAVDA of 13 April 1979, "A House to Order."

4. "What a Rural House Should Be Like." The journal SEL'SKOYE KHOZYAYSTVO ROSSII, No 8, 1979.

5. "Narodnoye khozyaystvo SSSR v 1977 g.", op cit, p 412.

6. In the table data are used from the article of G.N. Fomin "Prospects of Transformation of Inhabited Places." In the collection "V pomoshch' proyektirovshchiku-gradostroitelyu" [In Aid of the Town Planner]. Kiev, izd-vo "Budivel'nik", 1971.

7. "What a Rural House Should Be Like," op cit.

8. "Materialy XXV s"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1976, p 125.

9. For example, transport expenditures in the delivery of traditional stone materials to rural housing construction may amount to one-third or more of the expenditures for materials.

10. It is significant that reasons of economy oblige U.S. farmers, for example, to accomplish with their own efforts 20 percent of the total volume of agricultural construction in the country.

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AGRO-ECONOMICS AND ORGANIZATION

UDC 63.1

GENERAL REVIEW OF OUTLOOK FOR AGRICULTURAL SPECIALIZATION IN USSR

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 5, May 80 pp 25-35

[Article by Professor A. K. Il'ichev, doctor of economic sciences, All-Union Order of Lenin and Order of the Labor Red Banner Academy of Agricultural Sciences imeni V. I. Lenin: "The System of Managing Agriculture in the Current Phase"]

[Text] The advances of scientific-technical progress in the postwar period created the potential for a higher growth rate of labor productivity in agriculture than in industry. This is confirmed by the experience and practices of the leading kolkhozes and sovkhozes of our country as well as by data on agriculture in the developed capitalist countries, which can be judged from statistical materials of the United Nations Food and Agriculture Organization (FAO). The main factor that underlies this potential, the principal means of agricultural production, is the land. When land is used rationally it is not subject to either wear or obsolescence. Moreover, if the land is used correctly its physical properties steadily improve and the matter of the soil is converted to a condition in which plants can use it. As K. Marx believed, the productivity of farmland can be raised year after year for an indefinite time.

To take advantage of the potential of agriculture under conditions of developed socialism it is necessary to work out and introduce scientifically substantiated systems of agricultural management for each natural-economic zone. This must be based on the principles of Marxist-Leninist theory regarding rational management of agriculture and the advances of contemporary science, applied with the necessary equipment and technology for production of each agricultural crop and for each sector. The main thing here is to determine methods of rational use of the land which, in K. Marx's words, not only provides essential objects of everyday consumption but also serves as a kind of "storehouse" for stockpiling and accumulating organic elements, in other words, for expanded reproduction of the conditions of existence for the sequence of human generations.

We must also remember Lenin's point that "the land has qualities that are absolutely insurmountable (if we disregard the possibility of laboratory production of protein and food, which is too remote and too problematical). As a result of these qualities, large-scale machine industry in agriculture will never have the same characteristics as it does in industry."[1] As a result of this, the concept of the "system of management" arose historically only in the sector of agriculture.

In the 19th Century the issues of rational management of agriculture were considered in detail by Tyunen, Teyer, Liebich, and other European scholars who were well known to K. Marx and F. Engels. In the 19th Century and early 20th Century these questions were studied by the Russians A. N. Yermolov, M. I. Lyudogovskiy, A. I. Skvortsov, and A. N. Engel'gardt. V. I. Lenin was familiar with their works.

For the modern, large-scale socialist agriculture of our country scientists and specialist have developed scientifically substantiated systems of agricultural management applicable to all the natural-economic zones and for a number of autonomous republics and oblasts. These systems include full programs of technical, technological, and economic organizational measures and serve as the basis for composing plans of agricultural development and for writing standard technological charts and norms for development of the plans for administrative organization of agricultural enterprises. New opportunities have now arisen for improving the machinery and technology of production of all agricultural products and, accordingly, of agricultural labor. Development of the processes of interfarm cooperation and furtherance of specialization make it possible to switch the production of various products to an industrial footing. All this demands a theoretical generalization of accumulated experience and scientific findings for the development of new proprosals to refine and scientifically substantiate systems of agricultural management for all the natural-economic zones of the country in the future.

In planning the future development of our country's agriculture material and labor resources should be concentrated in those sectors that are vitally necessary to society and those in which it is possible to attain the highest labor productivity compared to the average level. It should be considered that the current opportunities for international division of labor permit economies of social expenditures of labor and capital. In developing proposals for refining systems of agricultural management it is important to determine the quantitative ratios of all material elements as exactly as possible and search for optimal proportions among them at the particular agricultural enterprise or interfarm association. We must remember that agriculture is not just a sphere of material production from which we receive food products and industrial raw materials for current consumption, but also a "storehouse" for the accumulation of energy and biological elements in the soil, growth in its biological productivity, and improvement in its fertility. In all the natural-economic zones of the country, therefore, and especially in the steppe and southern regions, it is necessary to envision steps to protect the environment: combat soil erosion, reinforce sand with appropriate tree planting, install wooded windbreaks, and other antierosion techniques.

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[1] Lenin, V. I., "Poln. Sobr. Soch." [Complete Works], Vol 5, p 137.

When working out measures to refine the systems of agricultural management applicable to the characteristics of each natural-economic zone of the country it is important to establish all the qualitative and quantitative parameters of the land as the principal means of production. For example, organizing and rationally managing agricultural at kolkhozes and sovkhozes of the steppe regions of the country requires that the land be able to absorb all the precipitation that falls during the year in the plowing horizon. This is feasible only if surface runoff in all ravines, gullies, and other low places is regulated, the surface of certain land areas is terraced, and wooded windbreaks are planted.

Further refinement of the systems of agricultural management will require review of the economic foundations of rational siting and specialization of agriculture and consideration of the opportunities now appearing for international division of labor, especially for economic cooperation with the socialist countries. A comprehensive analysis of the natural resources and degree of suitability of soil and climatic conditions is necessary for organizing agricultural production. The current level of industrial development allows our country to act as supplier of many types of industrial articles and raw materials in world economic cooperation and the international division of labor. At the same time it should be noted that the natural conditions of our country, despite our vast land resources, are less favorable for the production of many agricultural products than conditions in most countries of the world.

Only grain production has more favorable conditions for development in our country. Just the opposite is true for raising most of the special crops such as tobacco, citruses, tea, and the like. Of course, we must plan to increase their production in various places in the country in the future, but nonetheless it is expedient to use our opportunities for receiving them in exchange for industrial goods in mutual advantageous economic cooperation with other countries. In exactly the same way the development of all the animal husbandry sectors and production of livestock products cannot be considered as an economically efficient form of production for export because we do not have any significant advantages with which to achieve higher productivity and efficiency than the developed countries of Europe or such other lands as Australia and New Zealand.

From what has been said we may conclude that the economic foundations of rational management of agricultural in our country and further specialization and concentration in the period of developed socialism should be:

1. A determination of the quantitative dimensions of the future needs of our society for food products according to scientifically substantiated norms, for agricultural raw materials, and for meeting other needs of the society.

2. A determination of the place and role of each sector of agriculture and each crop in satisfying the needs of society and their role and place in the international division of labor of the socialist countries in mutually advantageous trade with the developing and with certain capitalist countries.

3. Maximum consideration of the characteristics of the machinery and technology of production that dictate that each natural-economiz zone, and especially each uniquely favorable microzone, should be the site of the appropriate types of specialized enterprises, not of production of a particular product or sector of agriculture. In this case the particular microzones will become the sites of interfarm associations and agroindustrial complexes with full production cycles involving various sectors and products that are interrelated technologically and organizationally and have optimal ratios of all material elements. They will provide "no-waste" production, correct exchange of matter between humans and nature, and automatic restoration and improvement in soil fertility.

The advances of modern science, contemporary technology, and the possibility of organizing the production of all agricultural products on a nationally planned basis demand review and modification of certain organizational and production relations in the production of all agricultural crops and sectors which were formerly considered to be correct. Current technologies for influencing the soil, for example affecting its physico-chemical condition (energy-intensive tractors, means of land reclamation, mineral fertilizers, herbicides, and so on), make it possible today to raise good crops in one place for 2-3 years and more.

Let us consider this with the example of several of the most important sectors and crops. Raising grain crops in our country is economically justified and will be done in the foreseeable future not only at specialized grain farms but also at farms which will have intensified specialization in various industrial crops and at all specialized livestock farms. At least this can be said of a large majority of the economic regions. As for those places where conditions are especially favorable for the production of grain crops, which means the southern parts of the Ukraine, the steppe regions of the North Caucasus, the Middle and Lower Volga, the Southern Urals, North Kazakhstan, and Siberia, the organizational structure of the individual agricultural enterprise in these regions should include the livestock sector, and in some regions sheep raising. In other words, it should be a specialized grain-livestock enterprise, with sheep raising added in certain zones.

At these farms high labor productivity can occur only given certain technological and organizational conditions, namely:

a. a combination of grain fields with fields of other crops whose working times do not coincide with those of the grain crops;

b. creation of conditions for using all the straw and chaff within the given microzone as livestock feed;

c. preventing soil erosion, involving broad introduction of soil-protective systems of farming, planting wooded windbreaks on 4-5 hectares per 100 hectares of grain fields, constructing ponds and reservoirs to fully regulate runoff, and so on.

Analysis and generalization of data from research and developed systems of agricultural management in these zones shows that in a rational structure of planted areas at specialized grain-livestock farms grain fields should not take more than 70 percent of the arable land; in certain regions where clean fallow is essential they should not even exceed 60 percent. It is possible that the sectors of meat-dairy cattle raising and sheep raising will be organized at them in part on an interfarm basis, but in this case the agricultural land within the particular microzone should include, for each 100 hectares planted to grain crops, 4-5 hectares of field-protection wooded windbreaks and windbreaks around production centers, residential areas, and the like, 40-42 hectares planted to grass crops, including 12-15 hectares of alfalfa or an equivalent amount of other high-protein crops because only in this case will feed resources contain the optimal amount of protein. Thus, a complete, "no-waste" technological and organizational plan of production in a particular steppe microzone can be achieved with production of market grain, beef, and milk, as well as mutton and wool in many microzones. The sheep products can be received through either further specialization within the farm or interfarm cooperation, that is, construction of a large livestock complex in the microzone. In this case all the farms of the microzone become not just market grain producers, but also suppliers of all types of feed for the complex.

There are exceptional opportunities today for setting up specialized grain-livestock farms on irrigated lands in the Volga region. Their market products will be wheat and grass meal from alfalfa for the mixed feed industry, as well as beef within certain limits. Based on the data of experimental proposals by Giprovodkhoz [All-Union State Planning, Surveying, and Scientific Research Institute of Water Management Construction], the Volga Branch of VNIIESKh [All-Union Scientific Research Institute of Agricultural Economics], and many other scientific institutions, the model organizational structure for such a specialized grain-livestock farm would be as follows: total area -- 15,000-20,000 hectares; irrigated area -- 7,000-8,000 hectares; number of cattle -- 4,000-5,000 head, 40 percent cows. Up to 40 percent of the irrigated land can be occupied by alfalfa for a period of 3-4 years. In addition to the alfalfa up to 50 percent of the irrigated land will be planted in winter and spring wheat and winter and spring barley. The crop rotation of such a farm will have 3-4 fields of alfalfa, a field of hard spring wheat after long fallow, a field where long fallow is turned over, a field of winter wheat, a field of barley with alfalfa undersown, and a field of corn for silage.

The experience of leading sovkhozes in the steppe regions of the country such as the Gigant grain sovkhoz in Rostovskaya Oblast, Tikhoretskiy Sovkhoz in Krasnodarskiy Kray, Temizhbekskiy Sovkhoz in Stavropol'skiy Kray, and many others in Volgogradskaya, Saratovskaya, and other oblasts has shown that with a rational system of production management such specialized grain-livestock farms in appropriate microzones where there are no large irrigated areas can maintain 25-30 head of cows per 100 hectares of arable land and produce up to 1,600 quintals of commodity grain, 60 quintals of meat, slaughter weight, and up to 500 quintals of milk. At grain-livestock farms on irrigated lands in the Volga and Middle Don regions with 50 percent of the fields in grain, 40 percent in alfalfa, and 10 percent corn for silage, it is possible to receive 2,000-2,500 quintals of grain, 500-750 quintals of grass meal, and 70-120 quintals of beef.

At such a farm a mechanized team of 12-13 workers, using four tractors of different sizes, a set of equipment for soil tillage and harvesting the grain, and installations for drying the alfalfa and producing grass meal, will be able to do all jobs for the year for an area of 500-600 hectares, working 120-130 days almost evenly spread through the summer period. For its part, a mechanized team of four workers can feed out 1,000 head of cattle.

Experience with organizing sugar beet production has shown that it is economically efficient only as a constituent part of a large agroindustrial complex which combines raising sugar beets and seed, industrial processing of the beets, and feeding out cattle on production by-products. This agroindustrial complex should include, in addition to the beet plant, specialized kolkhozes and sovkhozes in a radius of up to 50 kilometers, a specialized farm for feeding out cattle, and a seed raising farm that produces sugar beet seed for all the farms in the raw material zone and uses plant waste products as fertilizer. Such an agroindustrial complex not only turns all production by-products into useful products, but also eliminates the seasonality of work for employees.

Maximum concentration of sugar beet raising in the zone of the beet plant does not mean monoculture, of course; within the microzone the proportion of sugar beets can be up to 25 percent. In turn, using all the by-products of beet production for livestock feed demands the presence of 200 cows,with annual milk yields of 3,000-4,000 kilograms of milk, per 100 hectares of planted area. The optimal structure of planting for the entire agroindustrial complex has been estimated at: 20-25 percent sugar beets; 40-50 percent eared grains and corn; 30-35 percent annual and perennial grasses for silage, forage, hay, and grass meal. Thus, conditions will be created for efficient use of all by-products and turning them into inexpensive milk and meat.

The technological and organizational relationships considered in the production of grain crops and sugar beets are very similar to those for other crop farming sectors. Therefore, the methods used to determine the optimal proportions of all material elements for them are fully applicable to any type of specialized crop farming, for example flax growing, potatoe growing, and vegetable farming at farms in the Nonchernozem zone of the country.

The data of progressive experience and scientific developments in systems of agricultural management show that an even greater degree of concentration and specialization is economically efficient in the production of potatoes, vegetables, fruit, berries, grapes, and a number of special crops such as tea, citruses, essential oils, and medicinal plants.

It is possible to raise 200-250 quintals of high quality potatoes per hectare at specialized farms that have large areas of light or medium soil of adequate fertility where the crop can be tilled and harvested in any weather without manual labor. Therefore, specialized potatoe farms in the Nonchernozem zone should be located primarily in those microzones that have light and medium soils. This applies even more strongly to farms that are raising grapes and special crops (tea, citruses, essential oils, and medicinal plants). In the future they must be concentrated entirely in the microzones that have uniquely favorable soil and climatic conditions; these microzones occur in a number of regions of Central Asia, in the Transcaucasian republics, the North Caucasus, the Ukraine, and Moldavia.

Let us now consider some questions of the theory of rational organization of the production of livestock products on a contemporary industrial basis. According to planning projections based on production charts and technical norms, the production of livestock products and the feed needed for this account for almost three-fourths of the 10 worker-days of total labor necessary to produce food products per capita according to scientifically substantiated norms. One thousand calories and the corresponding amount of protein in livestock products require five times as much total expenditure of labor and capital as the average 1,000 calories of field crop products. And then, within certain limits livestock products in human consumption may be interchangeable. The general and objective criteria for evaluating them will be:

> a. the quantity of biologically valuable nutrients that the particular species of animal gives per unit of feed expended, in particular per unit of the more valuable concentrated feeds; in other words, this is the "efficiency" of each species as a "machine" to process feed and make useable products;
>
> b. the potential for simplifying the technological chart of production, the possibilities of full mechanization and automation, and the possibility of carrying on even, continuous production on a large scale.

Analysis of scientific data shows that the amounts of feed, labor, and capital required to produce an equivalent (in terms of nutrition and biological value) amount of food varies greatly for different livestock products. According to zootechnical norms, for example, it takes 3.5-4 times as much feed, labor, and capital to get 100 grams of full-value protein and 1,000 calories from beef as from milk production. But the most inexpensive total output from cattle will be the result of combined production (meat and milk), not narrowly specialized production.

Conditions in our country do not, it seems, permit us to follow the example of the United States and develop primarily beef cattle, not dairy farming, and to breed chiefly beef cattle, not combined-purpose breeds. Only a few regions in the eastern and mountainous parts of the country with good natural pastureland and haymeadows can become specialized beef producing areas. The large majority of regions, and especially the Nonchernozem zone, the sugar beet regions, and a few others, should refine and develop combined and dairy breeds.

Theoretical analysis of the principles of rational management and organization of the production of livestock products on a contemporary industrial basis demands a determination of the economic foundations of rational feed production, because feed accounts for 50-70 percent of total costs. And they must be determined not just by expenditures to raise and harvest the crop, but also the costs of delivering it to the feed bins. At the present time the feeds are ranked as follows by the criterion of prime cost of a feed unit considering costs to deliver the feed to the trough (from least expensive): grasses of cultivated meadows and pastures and improved natural pastures and haymeadows; perennial and annual grasses in field crop rotations used as forage; haylage and silage prepared from all types of annual and perennial grasses; concentrated grain feeds; silage made from corn and sunflower; all types of root feeds, including sugar beets; potatoes.

If the prime cost of feed in the grass of cultivated meadows and pastures is taken as one unit, the prime cost of a feed unit in other types of feed based on normative figures in production charts will be: 1.2-1.4 for annual and perennial grasses for forage; 1.4-2.5 for haylage and silage made from all types of perennial and annual grasses; 2.0-3.0 for concentrated grain feeds; 2.5-4 for silage made from corn and sunflower; 3.0-6.0 for all types of root feeds, including sugar beets; 2.5-7.0 for potatoes.

The various types of waste products used for food are usually the most inexpensive feeds of all; for prime cost of a feed unit they are close to the prime cost of a feed unit of green grass in natural haymeadows and pastures. Therefore, various types of straw, chaff, green tops, sugar beet pulp, and similar feeds are cheapest and should definitely be used in the meat-dairy sector. Thus, the prime cost of all livestock products depends on maximum use, within the limits of allowable physiological norms, of appropriate groups of inexpensive feeds and maximizing the proportion of them in the feeding ration, while maintaining digestible protein and the full assortment of essential amino acids.

Generalization of scientific findings and progressive experience at agricultural enterprises in our country and abroad with feed production allows us to say that the crop farming sectors of khokhozes and sovkhozes produce the most inexpensive and high-value protein feeds under current conditions.

In the European countries, especially Holland, Denmark, and others where the production of livestock products is highly developed, techniques of raising grasses on meadows and pastures and producing haylage, silage, high-value hay, grass meal, and grass bricquettes are now being refined.

Practical observations and theoretical calculations show that new opportunities for raising labor productivity and reducing expenditures have appeared today at kolkhozes and sovkhozes in the production of high-value feeds. It has become possible to receive high-value feeds not only (and in the future, possibily, only secondarily) by grain production but also by by maximizing the cultivation of bulk green matter of all types of perennial and certain annual grasses, which can then be converted to grass meal or bricquettes with a nutritional value of 0.75-0.8 feed units per kilogram and, moreoever, has significantly more vitamins and amino acids than grain feeds. By pressing out the cell sap from the bulk green matter and then drying it has become possible to produce almost pure protein, that is, to get a concrentrate that is more valuable than grain. Hungary, France, Great Britain, and various other countries already have patented machine designs and entire flow lines that produce protein concentrate from green plants. A plant recently went into operation in Hungary, for example, using Vepeks technology to produce a protein concentrate with 45-70 percent protein and four percent cellulose; it also produces coarse feed with 35 percent cellulose and 10-15 percent protein. The protein concentrate is fed to hogs and poultry and the coarse feed goes to ruminants. Using bulk green matter in this way makes it possible to get much more full-value feed from a unit of land. With fairly dense planting and good development, the amount of bulk green matter in a vetch-oats mixture or pea field can reach 300 quintals per hectare and more in the phase of full flowering and start of fruit formation. If cut at this time and turned into grass meal or bricquettes, it will produce 60 quintals of high-value feed containing 42 quintals of feed units with a minimum of 15 percent protein. The same hectare planted in grain can produce 20 quintals of grain and 30 quintals of straw with the same labor expenditures and full maturation of the crop. This is not more than 32-35 quintals of feed units, and there will be less total digestible protein in the grain and straw.

Harvesting an oats-vetch mixture or peas in the beginning of the fruit formation phase will cut the growing season by at least 30 days and in many regions this will allow double cropping. Thus, the overall productivity will be greater calculated per unit of land and per unit of labor expended.

Artificial drying of the bulk green matter and making it into grass meal and bricquettes, as well as extracting the cell sap, improve the economic efficiency of raising all types of perennial grasses, especially alfalfa on irrigated land. A new approach should be taken to evaluating a number of feeds and feed crops and future plans for their production should further enlarge the area planted in all types of annual and perennial grasses as a source of full-value and inexpensive feed. VASKhNIL Academician I. V. Larin has written persuasively on this subject.

Preserving the cattle sector in the organizational structure of most specialized agricultural enterprises in almost all natural-economic zones is a crucial condition of a rational system of agricultural management, for this is the only way to make straw, chaff, beet tops, and the like into useable products, that is, to complete the biological cycle of matter. But the cattle sector can be the primary, or even the only, sector of a large livestock complex that produces meat and milk. At such a complex it is possible to organize a kind of "no-waste" production cycle entirely within the enterprise, using food crops entirely and applying the manure without significant additional expenditures as fertilizer. This must be done in compliance with requirements for avoiding environmental contamination, of course.

Setting up narrowly specialized complexes to produce meat and milk is especially rational in those microzones which have floodplain lands or other land that can easily be converted to cultivated pasture and meadow land. Lukhovitskiy Rayon of Moscow Oblast, and in particular the land of the Krasnaya Poyma Sovkhoz, is an example of a microzone that is uniquely suitable for setting up a large complex to produce meat and milk. The natural and economic conditions of this farm, and probably of other farms in the rayon,have already allowed them to achieve high indicators for labor productivity and efficiency of milk-meat production. Among these conditions are proximity to Moscow, good roads, large areas of haymeadows and pasture, and a large proportion of floodplain land. But taking a number of steps to organize the agricultural regions better and doing reclamation work to raise the productivity of the plowland, meadows, and pasture offers the farms of this microzone a chance to produce 1,800 quintals of milk per 100 hectares of agricultural land. An interfarm association for milk and meat production in the microzone could raise all young animals not needed for restocking to produce meat and also raise the necessary number of heifers to restock the basic dairy herd.

The entire rayon, and the Krasnaya Poyma Sovkhoz in particular, could serve as a kind of "standard" for organization of a large livestock complex to produce milk and meat where cattle are kept in pasture camps in the summer and loose in stalls in the winter. Such an interfarm association would have very high labor productivity. The amount of milk and meat produced by one worker would fully satisfy the milk needs of 400-500 persons and the meat requirements of 100-150.

At such a specialized enterprise or complex to produce milk and meat should other sectors be set up if the natural and even economic conditions for them are also entirely favorable? It may be possible, for example, to develop sheep raising, to produce a certain quantity of potatoes, or to plant fruit orchards and berry patches.

Nonetheless, the answer to the question must be "No," because the material and technical character and technology of meat-milk cattle raising allows rational use of the land and all by-products within the sector with the same degree of evenness and smooth-flowing production that could be attained if other sector. were set up.

The organization and rational management of agriculture in the period of developed socialism demands that many jobs done in agriculture be transferred to special industrial enterprises and organizations. This is the only way that the advantages of large-scale production can be used at the kolkhozes and sovkhozes and at the corresponding special interfarm enterprises producing agricultural products. The industrial enterprises and special organizations should not only process agricultural output, store it and deliver it to the consumer, but also take on many purely agricultural jobs such as application of fertilizer and controlling pests and diseases. Performing particular agricultural jobs by purely industrial methods will promote growth in the efficiency of production of all agricultural products.

There is one more form of industrial assistance in the development of agriculture that must be mentioned. This is rational multipurpose construction of certain structures for agriculture, forestry, and water management, not just for industry and municipal systems. For example, many bridges and dams across ravines, gullies, and small streams are built during the construction of railroads and highways. In each case, with minor additional expenditures, they could be made into water management structures with sluices and create reservoirs that kolkhozes and sovkhozes need. Tree planting along roads must be done as part of an overall system of field-protection planting and antierosion structures.

These, in our opinion, are the general theoretical foundations of rational management of agriculture in light of the basic principles of Marxist-Leninist agrarian theory, on a modern industrial basis, in our country and abroad.

Conclusions

The material characteristics of agriculture allow it to achieve a higher rate of growth in labor productivity than the industrial sectors. During analysis and determination of the general theoretical principles of rational management of agriculture in a developed socialist society attention should be focused on establishing the qualitative and quantitative parameters of the principal means of agricultural production, the land, and on rational siting and specialization of agriculture.

Despite our vast land area, the natural conditions of our country are less, not more, favorable for producing many agricultural products than are conditions in most countries of the world. We have reviewed a number of new criteria for establishing rational organizational and technological ties in the production of agricultural crops and sectors using the example of specialized grain-livestock farms, production of sugar beets, as well as potatoes and certain other crops. In our opinion, the conditions of our country do not allow us to follow the example of the United States and develop beef production more than milk production, to breed beef cattle, not combined-purpose cattle, in the near future. We have considered ways to improve and organize rational feed production applicable to conditions in the USSR, and have expressed a number of projections on issues of scientific-technical progress in agriculture and in our country's entire agroindustrial complex.

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AGRO-ECONOMICS AND ORGANIZATION

CONSUMER COOPERATIVES HAMPERED BY EQUIPMENT SHORTAGES

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 80 p 17

[Article by V. Mityushkin, chief of the RSFSR Potrebsoyuz Main Administration for Procurements and the Processing and Sale of Potatoes, Vegetables, Fruit and Melon Crops: "Taking Demand Into Account"]

[Text] In the 10th 5-Year Plan the RSFSR's cooperative workers purchased approximately 30 million tons of potatoes, fruit and vegetables. But I would like to emphasize that we purchase agricultural products not only from the kolkhozes and sovkhozes but also from the public. The RSFSR Potrebsoyuz purchased over half the potatoes, approximately 60 percent of onions, practically all the garlic and more than one-third of fruit and berries on the private plots.

Our organizations lay in annually approximately 1 million tons of potatoes and fruit and vegetables for cooperative trade and public catering for the between-season period.

We Are Expanding the Network of Depots

The constant development and reinforcement of the physical plant is promoting success. The procurement organizations of the republic's consumer cooperatives currently have vegetable-potato and fruit repositaries with a simultaneous capacity of 1.1 million tons and acceptance-procurement and fermentation-pickling centers of 650,000 tons. Over 30,000 acceptance centers are open to take in the public's potato and fruit and vegetable surpluses in the procurement season.

At the same time in certain potrebsoyuz's the physical plant still does not conform to modern requirements, equipment needs to be replaced and the production shops are in need of modernization. For this reason it is planned in the next few years to build and commission fruit-vegetable repositaries with a simultaneous capacity of 334,000 tons and over 6,300 all-purpose centers for accepting the public's agricultural product surpluses. A number of operating repositaries will be modernized and furnished with refrigerating plants, forced ventilation and other engineering and material-handling equipment. The measures being adopted by the cooperative workers will help increase supplies of vegetables to the cities and industrial centers.

As is known, the public's vegetable, fruit, berry and melon crop requirements are not yet being fully satisfied.

We also definitely share the blame for this. The potrebsoyuz's and procurement organizations are not yet displaying sufficient concern to strengthen economic relations with the kolkhozes and sovkhozes and do not always strive to fulfill their forward-contract agreements.

There is also potential in an improvement in concluding contracts with the public for the sale of product surpluses. Whereas in 4 months last year, say, the Stavropol'skiy Potrebsoyuz concluded 65,000 contracts, in the same period this year it concluded only half as many. The Severo-Osetinskiy, Permskiy, Kurganskiy and a number of other potrebsoyuz's are working inadequately with the public. Our workers' business relations with the orchard and garden partnerships have been inadequately organized.

Acceptance on the Spot

Many years' experience testifies that supplies to the public of vegetables and fruit in full volume and broad assortment and of high quality with the least production, storage and overhead costs is a complex problem. Its solution depends on smooth operation in the sectors incorporated in the country's agrarian-industrial complex, primarily agriculture, procurements, trade and transportation. Unfortunately, there is not yet full coordination among these sectors.

There are frequent instances of farms cultivating not the types of vegetables needed for supply to the public but those which are less laborious and more profitable. Thus in the past 4 years of the 10th 5-Year Plan the RSFSR consumer cooperatives have had a receipt shortfall, compared with the plan, of approximately 4 million tons of potatoes, over 35,000 tons of onions, almost 140,000 tons of tomatoes and 200,000 tons of cucumbers.

Take such a product as onions. Last year purchases thereof compared with average annual purchases in the 9th 5-Year Plan fell by almost 40,000 tons in Gor'kovskaya Oblast, 6,000 tons in Penzenskaya Oblast and 3,000 tons in Yaroslavskaya Oblast The cooperative workers of Belgorodskaya, Voronezhskaya and Kurskaya oblasts failed to fulfill the plan for purchases of onions. In order to fulfill the supply plans the RSFSR Potrebsoyuz purchases more than 60 percent of the onions from the public in the North Caucasus.

There is a similar situation with the cultivation of cucumbers. Purchases thereof by the cooperative workers of Belgorodskaya, Voronezhskaya, Kurskaya, Lipetskaya, Tambovskaya and other oblasts have fallen by more than 50 percent. Is it any wonder that the store shelves have not only less fresh but also less pickled and marinated cucumber. Many farms have stopped cultivating and selling to the state via the consumer cooperatives scallop squash, eggplant, sweet pepper, horse radish and other products.

There are no acceptance-sorting centers on certain kolkhozes and sovkhozes attached to consumer cooperatives. And everything, which has been disposed of without preliminary sorting and commodity processing, is taken to the consumer cooperatives' acceptance centers. As a result the centers receive thousands of tons of produce which is unfit for sale.

We believe that the time has come to determine the quality of the products on the farms prior to shipment and to record the results in documentary form. We believe that the existing procedure of payment for substandard products, their still being taken into account in the fulfillment of the sales plans by the kolkhozes and sovkhozes and the amount of the fines for the nonfulfillment of contractual obligations are imperfect and fail to insure the circulation of high-quality products.

What is preventing the consumer cooperatives accepting the products directly on the farms? Calculations show that it is economically profitable to accept on the spot in season no less than 4,000-5,000 tons of potatoes and fruit and vegetables on one farm. One farm's actual delivery to the consumer cooperatives last year was 192 tons of potatoes and 225 tons of vegetables in season. This is approximately one truck of potatoes or the same amount of vegetables per day. Naturally, it should be expedient to build acceptance-sorting centers on these farms, furnish them with material-handling, weighing and laboratory equipment and maintain a staff of commodity appraisers for determining the quantity and quality of the products.

A most important condition of the successful purchase of fruit and vegetables and the preservation of their quality is the timely and complete provision of the procurement organizations with packaging. But here also there is a number of unsolved questions which at times hold up procurement and shipment and affect the quality of the products.

Let us take, for example, the use of containers. Experience accumulated in Moldavia and the Ukraine shows their high efficiency in the transportation of potatoes, watermelons, root crops, cabbage and even apples. But the RSFSR's consumer cooperatives make extremely limited use of containers. While we have 108 technically equipped container yards, through which in the procurement season it is possible to accept and ship 350,000-400,000 tons of produce, we ship only 60,000-70,000 tons in containers, that is, 5 - 6 times less than available capacity. And, moreover, the vegetables are loaded into the containers directly in the container yards, when the products have been brought from the farms by motor transport piled up and mechanically damaged. And certain farms pack the products in containers, but are refused permission to deliver them to the cooperatives' acceptance centers: they do not have the handling equipment for this.

Transport Workers' Help Is Needed

In speaking of preserving product quality we have to mention the transportation workers.

This year the RSFSR's cooperative workers have to ship over 3.5 million tons of potatoes and fruit and vegetables beyond the autonomous republics, krays and oblasts. The volume of shipments of these products increases every year. The bulk goes by railroad. Nevertheless, being an intermediary between the procurement organizations and trade, the railroad is not responsible for the preservation of vegetables shipped under the suppliers seal. These constitute the majority of shipments. And the reason? Not all railroad stations have mobile weigh bridges. Nor is the railroad held responsible for a failure to observe the product delivery times, the tardy and incomplete supply of cars for shipment of the products and so forth. All this causes losses and a lowering of the quality of the vegetables. Insufficient refrigerator cars are allocated for the transportation of fruit and vegetables.

Similar complaints may also be made about water transport. The rivermen do not, unfortunately, have specialized ships for carrying tomatoes and watermelons from Astrakhanskaya and Volgogradskaya oblasts. All-purpose large-capacity ships are supplied for the cargo handling, and 600-800 tons of products are loaded. It takes more than a week to accumulate such a quantity of tomatoes or watermelons. Loading these ships in a day or two is impossible, as, incidentally, is their unloading. It would evidently be advisable to introduce in river transport the containerized transportation of vegetables on small ships. I believe air transport is needed to deliver early products from the production zones to consumers in the industrial centers and regions of the Far North.

The speediest solution of the issues raised in the article will enable us to improve the organization of the procurement and supply to the public of vegetables, fruit and berries.

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AGRO-ECONOMICS AND ORGANIZATION

NEW MEASURES TO BOOST BELORUSSIA'S FRUIT GROWING

Minsk SEL'SKAYA GAZETA in Russian 3 Jun 80 p 2

[Editorial response to report on Belorussia's horticultural problems: "The 'Profitable' and 'Unprofitable' Apple"]

[Text] Under this heading a report was carried in SEL'SKAYA GAZETA of 22 March which dealt with the problems of horticulture in the republic. As F.V. Mirochitskiy, deputy minister of agriculture of the Belorussian SSR, informed the editorial office, the shortcomings in the development of horticulture do indeed exist.

The lack of due attention on the part of the economic-planning and administrative authorities to the development of horticulture, the low profitability of small-scale, fragmented fruit growing, the lack of horticultural specialists, specialized equipment, transportation and packaging, the unsolved state of the problem of marketing and industrial processing and the shortage of fruit repositaries on the farms and in the procurement organizations are the principal reasons for the sector's continued lagging.

The main direction of the development of horticulture in the republic is the organization of the industrial production of fruit and berries on specialized farms with an area of perennial plantations of 600-1,000 hectares each. It is planned to concentrate orchards on 25-30 specialized sovkhozes and 20-25 interfarm fruit complexes with a total plantation area of 60,000 hectares and a harvest of 200-250 quintals per hectare.

A republic horticultural trust was set up on the basis of financial autonomy following a decision of the directive authorities to fulfill the outlined program and improve management of the development of horticulture. It has 17 sovkhozes under its jurisdiction. A number of specific measures has been determined for organizing the cultivation of planting material, laying out the orchards and small-fruit plantations and modernizing existing plantations.

A master plan of the development of industrial fruit growing and the location of orchards in the republic for the period 1981-2000 will be formulated in 1980-1981.

It is planned to accommodate fruit-berry plantations on an area of 20,000 hectares, including 2,000 hectares of small-fruit plantations, on specialized sovkhozes in the period 1980-1990. The new orchards will mainly be laid out with the use of cloned rootstock, consolidated planting patterns (500-800 plants per hectare) and the formation of a free planar top.

The industrial orchards will mainly be taken up by late-ripening apple tree varieties--"bananovoye," "beloruaskoye," "malinovoye," "spartak," "avdared" and others--and 9-10 percent will be occupied by berry plants, the leading ones of which will be blackcurrant--40 percent--and strawberry--35 percent.

The nursery farms, which have been notified of their quotas for the cultivation of planting material of fruit-berry crops, have been determined. The bulk of their production will be concentrated in three fruit-nursery complexes in Gomel'skaya, Grodnenskaya and Minskaya oblasts with an annual production of 3 million fruit crop nursery plants, 100 million strawberry seedlings and 15 million berry shrubs.

In connection with the fact that the main areas of the new intensive orchards will become commercial fruit bearing no earlier than 1990 the Belorussian SSR Ministry of Agriculture and its bodies locally are implementing a number of concrete measures to enhance the productiveness of the existing orchards.

There will be a stock-taking of the orchards on the republic kolkhozes and sovkhozes in 1980, and the question of the rational use of each sector of orchard will be settled. In the period 1980-1985 it is planned to top and carry out a rejuvenating trimming of the trees in the plantations of economic value. It is intended to implement a package of organizational-technological methods to maintain the row spacing, apply fertilizer and fight orchard pests and disease. This will enable us to supply the public more fully with fruit-berry products.

The creation of specialized horticultural farms, the increased level of concentration, the reinforcement of the farms' physical plant and the centralization of management of the sector will enable us to considerably improve the state of affairs in fruit growing and increase fruit and berry production in the republic.

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MORE TRACTORS NEEDED FOR PRIVATE PLOTS

Minsk SEL'SKAYA GAZETA in Russian 29 Jul 80 p 2

[Editorial response: "From the Counter or From the Garden"]

[Text] The report under the above heading carried in SEL'SKAYA GAZETA on 18 May, the Brestskiy Oblispolkom informs us, correctly raises the question of organization of the tilling of the citizens' attached plots with the help of rayon consumer service centers.

It is possible to organize such services if the rayon consumer service centers are supplied with low-power tractors with the appropriate mounted equipment. These tractors are chiefly allocated for the kolkhozes, sovkhozes and other agricultural organizations.

The oblispolkom requested that the Belorussian SSR Gosplan examine the possibility of the allocation of 20 specific-purpose tractors to the rayon consumer service centers with a distribution of tractor resources in 1981 for organizing the tilling of the citizens' attached plots in the oblast's rayon centers.

The kolkhoz boards and sovkhoz managements are rendering constant assistance in the tilling of the kolkhoz members' and sovkhoz workers' private attached plots.

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SHORTAGE OF AGROCHEMISTS, ENTOMOLOGISTS REPORTED

Moscow PRAVDA in Russian 18 Jul 80 p 2

[Article by V. Nikonov, chairman of the "Soyuzsel'khozkhimiya" Association and deputy minister of agriculture of the USSR: "For Increased Fertility"]

[Text] A good deal of bad weather hit the fields of Cherkasskaya Oblast's "Dnepr" Kolkhoz last year. And when the rains passed them by, summer sultriness often paid a call. But the dry winds failed to cause any great damage. The kolkhoz accounts record figures which could only gratify farmers even in a propitious year. From the entire sown area the farm's collective obtained an average of 40.5 quintals of grain per hectare and 44.3 quintals of millet. The yield was one-third higher than the rayon average.

The question arises: what helped the "Dnepr" Kolkhoz grain growers overcome the whims of the weather? A wide-ranging complex of operations aimed at increasing the standard of farming is the basis of their success. An important role here belongs to fertility work. The agrochemical center which was set up here has grown into a specialized financially autonomous well-equipped subdivision. Its collective is engaged in the accumulation and preparation of organic chemicals, skillfully organizes the storage of fertilizer and plant-protection agents and uses them strictly in accordance with the cartograms. Last year each hectare of plowland on the farm received 16 tons of organic and 7.5 quintals of mineral fertilizer.

More than 3,000 agrochemical centers like that created on the "Dnepr" Kolkhoz have been organized in the country. In addition, 27,000 mechanized fertility detachments are in operation. The scale of their work is quite appreciable. Last year they applied to the soil 76 million tons of fertilizer and 822 million tons of organic chemicals, limed acid soils over an area of 6.6 million hectares and protected 70 million hectares of sowings against pests, disease and weeds.

Addressing the CPSU Central Committee July (1968) Plenum, Comrade L.I. Brezhnev observed that among the measures for the intensification of agricultural production the further development of the production of mineral fertilizers and plant-protection agents and concentration of agro-chemical work in the system of agricultural authorities deserved the most earnest attention.

A single specialized agrochemical service has now been created in the country. Skilled personnel have been selected and the necessary physical plant has been allocated for it. The period which might be called organizational is behind us. Some 3,000 "Sel'khozkhimiya" production associations operate in the rayons, as do 152 in the oblasts, and each union republic has a production-science association.

The all-union "Soyuzsel'khozkhimiya" Association is the center of this entire service. The production and scientific activity of its subdivisions should in the next few years have a considerable effect on an increase in the crop yield, an increase in the gross harvest and an improvement in product quality. After all, even today the volume of agrochemical operations is in excess of R5 billion. Performing them in good time and with high quality and striving for a comprehensive solution of the problems of an increase in soil fertility and plant protection will mean obtaining from these same resources additional millions of tons of grain, fodder and other products.

Understandably, the period of the coming into being of the new subdivisions is not without its difficulties. After all, many questions of an organizational, economic and technological nature demand a different approach from before and a serious search for and profoundly conceived solutions. Thus the "Sel'khozkhimiya" associations incorporate 206 oblast and zonal agrochemical laboratories and 152 plant-protection stations. What were they involved in hitherto? They studied the soils, drew up cartograms and made recommendations to the kolkhozes and sovkhozes. Their profile is now changing considerably. They have to provide each farm with planning-estimates documents for agrochemical operations for all fields and crops.

The organization of agrochemical centers on the kolkhozes and sovkhozes requires no less concern. The material basis for them exists--the mechanized fertility detachments. It is now important in each rayon to carefully conceive of an outline of the location of the centers, determine on what basis--farm or interfarm--they will be created, select from the specimen plans the warehouse premises and the centers for equipment maintenance and storage which are the most acceptable for a given zone and rationally locate runways.

A state-cooperative form of agrochemical service is being tested in practice this year in the Moldavian SSR and Belgorodskaya and L'vovskaya oblasts. It has a big future, we believe. It is right here that extensive scope is revealed for pooling resources and uniting the efforts of the state and the farms in the creation of the physical plant of chemicalization and converting it from a servicing element to a technological element of kolkhoz-sovkhoz production.

Of course, agrochemical work cannot manage without the help of scientists. We need meticulously formulated, clear-cut principles of economic mutual relations between agricultural enterprises and the "Sel'khozkhimiya" production associations. It is necessary to find and verify in practice a method of remuneration of the machine operators and specialists more fully linked to final results--the crop yield and the returns per kilo of nutrients.

The attention of specialists of the agrochemical service is currently drawn to the problem of the complete preservation of the mineral fertilizers all the way from the plant to the field. Specialized self-dispensing mineral-fertilizer cars have already begun to roll off enterprise assembly lines. But how to take advantage of them if the majority of the rayon associations and oblast centers lack suitable warehouses and cannot accept these cars? And this is not the sole obstacle, moreover. The development of the physical plant of chemicalization as a whole still lags considerably behind the rate of manufacture of chemical products. Let us return to these on-the-line warehouses. The need for them has been satisfied only 37 percent, nor is everything in good shape when it comes to repositaries on the kolkhozes and sovkhozes. Is it to be wondered at that the fertilizers are stored in an extremely unsatisfactory manner and that there are big losses of nutrients? Elimination of these shortcomings is a principal task of the new service.

Numerous data in the possession of science and practice indicate that the most efficient method of applying mineral fertilizers is the local method. This method doubles the addition to the harvest. But there is no specialized equipment, and only 2 percent of the fertilizers is applied locally to the soil. At the same time more than half the fertilizers are "scattered" by the uneconomical broadcast method, which fails to produce the necessary yield. It would seem that it is time for the scientific research and experimental-design organizations to embark in earnest on perfecting the machinery system and for the Ministry of Agricultural Machine Building to begin production of new, more productive means of mechanization.

With every succeeding year the use of fertilizers on the farms, particularly compost prepared from peat, manure and mineral fertilizer, increases. But there is a shortage of machinery for applying them. And those which exist are of low productivity. Their carrying capacity does not exceed 4-5 tons and they have a low operating reliability. It is necessary to increase the manufacture of such machines as the PRT-10 and PRT-16 and highly productive loaders.

Among the numerous problems connected with an increase in the standard of farming we should not forget the liming of acid soils and an improvement in the salt marshes and saline soils. The country has more than 60 million hectares of acid soils and almost 80 million hectares of saline soils. A considerable amount of liming has been performed in the country in the past 7 years. In Belorussia, for example, the area of acid soils has decreased 23 percent, in Lithuania 29 percent, in Estonia 53 percent, in Moscow Oblast 41 percent and in Pskovskaya Oblast 28 percent. But the rate of liming (6.6 million hectares per year) is not meeting agriculture's requirements, particularly in the RSFSR's non-Black Earth and Far East zones. Here 10 million hectares of acid soils have not once undergone chemical melioration, and without this the effectiveness of the application of fertilizers is very low.

Work has begun in recent years in the country on improving the agrobiological properties of the saline soils. But the scale is small--200,000-300,000 hectares per year. A most important task of the agrochemical service is to expand the volume of the chemical melioration of the soils and double the productive power of this plowland. For this more serious scientific studies are needed, and it is essential to create a machinery system practically from scratch and to considerably increase the production of gypsiferous materials.

We also have to mention such a task of the agrochemical service as the assimilation of new forms of fertilizer--anhydrous ammonia and liquid complex fertilizers. Compared with solid forms, the production of liquid fertilizers is almost 40 percent less expensive for industry, and in agriculture expenditure on their application is reduced 49 percent. Unfortunately, there are no special capacities for the storage of liquid fertilizers. In the next 2 years it will be necessary to not only draw up rational plans for the location of such repositaries but also to build them.

The agrochemical service--in its unified complex--is taking only its first steps. The scale of its operations is challenging. But it is of paramount significance in the solution of the food problem. Much will depend here on the trained personnel which have joined and will continue to join the various subdivisions of the agrochemical service. The "Soyuzsel'khozkhimiya" Association has developed a program for the training and improvement of specialists. But we will not surmount this problem without the higher and secondary specialized academic institutions.

The country's agriculture now uses more than 70 types of fertilizer and chemical meliorative agents, the application of more than 130 types of pesticide is recommended, and methods of biological plant protection are developing rapidly. All this must be utilized correctly and comprehensively not only for the harvest but also in the struggle for the purity of the environment, which is within the capabilities only of skilled specialists. Yet only 7 percent of the kolkhozes and sovkhozes have agrochemists, and 5 percent have entomologists. I believe that the higher school was wrong to cut back on the graduation of agrochemists. The training of specialists in tekhnikums has practically ceased. We believe that there should be a fundamental change in the situation. Each republic must in the next 5 years secure agrochemists and entomologists with higher and secondary qualifications for its farms for on this will depend the effectiveness of the means of increasing soil fertility and protecting plants and, ultimately, the agricultural crop yield level.

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RAILROAD SUBSIDIARY PLOTS MUST BOOST PRODUCTION

Moscow GUDOK in Russian 17 May 80 p 1

[Editorial: "Our Food Shop"]

[Text] It is comparatively small, this railroad transport shop: 52 sovkhozes and subsidiary farms under the auspices of the road administrations of workers' supply and 230 hog-fattening centers under the auspices of the branch departments of workers' supply; and 16,600 head of cattle, 45,000 hogs, 18,400 sheep and just over 1 million laying hens. But even with last year's unfavorable conditions they provided for workers' supply 14,900 tons of milk, 8,700 tons of meat, 10.7 million eggs and 28,100 tons of potatoes and vegetables. If we add to the above the food products for the railroad workers' supply from the subsidiary rural plots organized under the auspices of the plants, locomotive and car depots and other transport enterprises, it may be said that there was quite a marked addition to the table.

Certain sovkhozes are the sole sources of provision of the departments of workers' supply with agricultural products. Thus the specialized "Fion" Sovkhoz caters fully for the supply of wholemilk to children's and medical establishments and the public catering enterprises of the Severnaya's Vorkuta Branch; the sovkhozes of the departments of workers' supply of the Zabaykal'skaya cater for the railroad workers' potato and vegetable requirements to a considerable extent, and the sovkhozes of the Krasnoyarskaya Line even have potato surpluses and help out their eastern neighbors.

Among transport's agricultural enterprises there are sovkhozes which could serve as an example for others: like the Krasnoyarskaya Line's "Uzhurskiy" and "Bogotol'skiy" and the Severnaya's "Osanovo" Sovkhoz, which has been a frequent participant in and prizewinner at the All-Union Exhibition of Economic Achievements. These farms harvest on average per hectare from 130 to 225 quintals of potatoes and from 350 to 640 quintals of vegetables. High milk yields have been achieved for a number of years on the Oktyabr'skaya's "Leninskiye iskry" Sovkhoz (up to 4,500 kilos per cow) and the Zabaykal'skaya's "Shilkinskiy" and the Severnaya's "Osanovo" sovkhozes (up to 4,000).

At the same time the potato and vegetable yield and productiveness of the livestock and poultry remain low on a number of farms. The Privolzhskaya's "Nesterovskiy" and the Zapadno-Kazakhstanskaya's No 8 sovkhozes, where barely as many potatoes were harvested as were planted and where the per cow milk yields are two-three times lower, bear no comparison with the above sovkhozes.

Comrade L.I. Brezhnev observed at the CPSU Central Committee July (1978) Plenum: "All that we wish to have from animal husbandry--more meat, milk and other products--all this ultimately depends on a sufficiency of fodder, and varied and high-quality fodder, moreover."

The livestock's stall period--a crucial time for stockbreeders--is now coming to an end. On those farms which last year displayed concern to provide the animals with forage and which take zealous care of them, there will be no drop in the milk yields or weight gains. But it is necessary right now to lay the foundation of the further development of animal husbandry--its forage base.

The recently adopted CPSU Central Committee and USSR Council of Ministers decree "Additional Measures To Increase the Production of Coarse and Succulent Fodder in 1980 and Raise Its Quality" directs us toward the better use of the available potential for the laying in of hay, haylage, silage and root crops.

Our fodder field is not very big--only 112,000 hectares. But even this land has many drawbacks and pastures and hayfields overgrown with shrubs requiring amelioration work. It boils down to equipment. The sovkhozes and subsidiary farms are in dire need of stump pullers, brush cutters and heavy bulldozers. We believe that the USSR Gosplan should increase the allocation of these units to them. And also of trucks and "Belarus'" tractors for the newly created rural farms of enterprises, organizations and establishments of the USSR Ministry of Railways.

However, we cannot sit waiting for this with our arms folded. It is absolutely essential now to apply a sufficient quantity of fertilizer to the fields and till the soil well in order to obtain green bulk for the supplementary feeding of the livestock as soon as possible. The task is not only to insure for the livestock a replete wintering but also to create a reserve--carryover fodder stocks for the next year.

Many readers submit proposals on the use of designated strips of land for agricultural purposes. It is essential to cultivate this land, they write, even out the furrows, remove the mounds, uproot the shrubs and drain the marshy areas. Such measures would put many thousands of hectares of currently vacant land into economic turnover.

This is an intelligent proposal, and such measures are being implemented on certain lines. Intervals of protective forest cover with some equipment could, we believe, be of great assistance to the sovkhozes and subsidiary farms of the enterprises in the procurement of fodder.

Particular mention should be made of such an "early-maturing" sector of animal husbandry as hog raising. The managers of many transport enterprises are still slow getting started and still pondering the suitability of the creation of their own subsidiary plots and further developing existing ones. This cannot be explained by anything other than a failure to understand the importance of the tasks put forward by the CPSU Central Committee and USSR Council of Ministers decree "Enterprise, Organization and Establishment Subsidiary Rural Plots." In accordance with instruction 52Ts of 18 December 1978 from the minister of railways, which was issued on the basis of this decree, the sale of "in-house" agricultural production is to have increased considerably in 1985 (compared with 1979).

A feasible task. But it is being fulfilled variously on the network's lines. Whereas in 2 years branches of the Gor'kovskaya Line built 8 livestock sections for 1,300 hogs from their own resources and are completing the construction of a further 8 for 1,050 hogs, work on the Privolzhskaya Line, where a sty for 1,000 head was to have been built this year, has not even started: the documentation has not been prepared.

Work is being performed extensively on the organization of subsidiary plots under the auspices of railroad transport enterprises on the Zapadno-Kazakhstanskaya, Tselinnaya, Sredneaziatskaya, Severnaya and Vostochno-Sibirskaya main lines. The collective of the Ulan-Ude Locomotive-Car Repair Plant created a large-scale subsidiary farm which produced 550 quintals of pork last year.

This is something worthwhile in all respects. Of course, it has its difficulties: a shortage of mixed feed, a lack of transport for hauling food waste.... But the Gor'kovskaya, whose initiative was approved by the Ministry of Railways and the Railroad Transport Workers Local Central Committee, succeeded in surmounting these difficulties and finding possibilities and necessary resources!

Time does not wait. The spring field work campaign is embracing ever larger areas of the country with every passing day. It is these very days that the foundation of the assured fulfillment of the plans and pledges in the final year of the 5-year plan is laid. The successful accomplishment of the task set by the party and government--providing the country with more grain and other agricultural products and securing reliable fodder reserves for each stockbreeding section--depends on the initiative and professionalism of the managers and the persistence, organization and activeness of every communist and all workers of the sovkhozes and subsidiary farms.

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LIMING, NITROGEN TOP DRESSING CRUCIAL FOR NONCHERNOZEM WHEAT

Moscow SEL'SKAYA ZHIZN' in Russian 13 Jul 80 p 2

[Article by P. Sudnov, doctor of agricultural sciences: "Agrotechnology and Grain Quality"]

[Text] Wheat grain from the Nonchernozem zone has for many years been generally low in protein content (just 10-12 percent) and poor in gluten. This prevents mills of the zone from producing high-grade flour. Each year wheat from the eastern regions of the country is imported to the zone to upgrade local wheat and make high-quality flour.

For a long time the explanation given for the low protein content and the inadequate yield and poor quality of gluten in the grain raised on podzol, soddy-podzol, and occasionally even gray forest soils was based on the abundant rainfall during the summer in the zone and its comparatively low temperatures during the time when the grain is forming and ripening. One can hardly deny the influence of these factors on the quality of the harvest. But another explanation has appeared recently, one which offers a chance to solve the problem.

Work done in the department of agrochemistry of Moscow State University under the direction of Professor N. S. Avdonin has established that the reason for the poor accumulation of protein in the wheat and other crops of the Nonchernozem zone is the acid reaction of the soil solution of local soils. Applying lime to them not only increases their yield, which was common knowledge before, but also intensifies the activity of enzymes in the process of grain formation. As a result the grain receives more nitrous and other substances necessary to formation of the protein-protease complex.

Liming makes it possible to mitigate the harmful effect of aluminum and manganese and increase the nitrification potential of soil microflora. The ammonia forms of nitrogen applied with fertilizer become more effective on limed soils. Thus, in tests with spring wheat raised on soddy-podzol soil without applying lime and fertilizer, the grain contained 11.4 percent protein. With application of a full-value fertilizer but without liming the protein content was 13.4 percent. When full-value fertilizer was applied to soil that had been limed the protein content was almost 15 percent.

Similar studies were made at the field crop testing station of the Moscow Agricultural Academy imeni K. A. Timiryazev. They showed that even in a wet year the protein content of PPG-559 wheat raised on prepared soil was 18.9 percent compared to 15.5 percent for unprepared soil; gluten content rose accordingly from 20 to 25 percent.

In addition to correct selection of the best prepared soil for wheat, it is important to choose the proper forerunner crops. In the Nonchernozem zone the best forerunners for wheat are crops that leave behind a supply of nitrogen (row and legume crops, long fallow perennial grasses, and furrow slice inversions of them). Planting wheat after wheat or oats will not generally give a high-quality grain.

In view of the usually slow outflow of plastic substances from the leaves and stem into the grain under conditions of the zone, it is useful to apply spring and summer top dressings. This technique has been studied thoroughly at the Scientific Research Institute of Agriculture of the Central Regions of the Nonchernozem Zone of the RSFSR. In one of their tests wheat fields were top dressed with 30 kilograms of ammonium nitrate and 60 kilograms of urea per hectare against a background of 120 kilograms of nitrogen, 90 kilograms of phosphorus, and 120 kilograms of potassium. When this was done the protein content in the grain rose from 11-13 percent to 14-15 percent and the gluten in 70-percent flour rose from 27-29 to 33-34 percent. The yield was 45-55 quintals per hectare.

According to generalized data from state varietal testing plots, non-root top dressing of wheat fields was most effective precisely in the Nonchernozem zone. The average gain in protein content in the grain over a number of years was more than six percent.

Many scientific and educational institutions of agriculture in the Nonchernozem zone have intensified the search for ways to improve the conditions of nitrogen feed to wheat in recent years. Among the methods are raising clover, applying nitrogen fertilizers after liming, and others. The results testify to the possibility of solving this pressing problem. And this is not only a matter of increasing the potential of the wheat plant itself, but also of mobilizing the nitrogen reserves of the acid soils of the Nonchernozem zone.

It is common knowledge that the plowed soddy-podzol soils have an average of 32 quintals of potential nitrogen bound in the humus of the top 20-centimeter layer per hectare. Gray and dark gray soils have 60 quintals per hectare in this layer. Leached chernozems contain 94 quintals of nitrogen per hectare, and thick chernozems have 115 quintals. As we see, the soddy-podzol soils of the Nonchernozem zone are poor in natural nitrogen compared to other types of soil. Therefore, it is extremely important in this zone to raise the level of nitrogen feeding. This can be done by rigorously following crop rotations including perennial leguminous grasses, in particular clover, using liming to make acid soils more akaline, and applying organic and mineral fertilizers, primarily nitrogen in combination with phosphorus and potassium.

In addition, wheat fields should be top dressed with nitrogen in the heading-flowering phase. All these steps will make it possible to improve the quality of the wheat grain and its food and industrial value significantly.

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TILLING AND CROPPING TECHNOLOGY

STEPS ENVISIONED TO IMPROVE WHEAT PRODUCTION IN KAZAKHSTAN

Moscow SEL'SKAYA ZHIZN' in Russian 24 Jul 80 p 2

[Article by A. Rybnikov, head of the agricultural divison of the Central Committee of the Communist Party of Kazakhstan: "Strong Wheat from the Virgin Lands"]

[Text] More than two-thirds of the strong wheat grain purchases by the state come from Kazakhstan. In the last four years 22 million tons of it has poured into state granaries. The high rate of qualitative growth in grain production since the 25th CPSU Congress testifies to the profound changes that are taking place in grain production given the general rise in agricultural efficiency owing to scientific-technical progress. It is the result of heroic, creative labor by the scientifist, specialists, and all farmers who have gone through the virgin lands experience and gained their skills here. In the 10th Five-Year Plan alone the sovkhozes and kolkhozes of Kazakhstan have earned an additional 925 million rubles for selling high-quality wheat to the state.

The party and the people named the 10th Five-Year Plan the five-year plan of efficiency and quality. The Central Committee of the Kazakh Communist Party, the oblast and rayon party committees, and the party organizations at kolkhozes and sovkhozes have done an enormous amount of organizational work to mobilize farm workers for the campaign to make grain fields more productive and improve the quality of the grain. Speaking in 1976 at a meeting of party and economic activists of the republic, Comrade L. I. Brezhnev stressed that "what the country needs is not grain in general, but good-quality grain in a broad assortment. This is especially important for Kazakhstan. You must strive to see that at least half of the state wheat purchases are the hardest and strongest wheat varieties." This statement by Leonid Il'ich became the program of action for party, Soviet, rural, and procurement agencies and all communists of the republic.

The Kustanayskaya Oblast party organization has achieved significant successes in this. Everyone in the oblast participates in work to improve the quality of the grain. In the first four years of the five-year plan 92 percent of the total volume of strong and valuable wheat varieties they sold to the state had high gluten content, for which the farms of the oblast were paid an additional 288 million rubles. The grain growers of Tselinogradskaya, Turgayskaya, Kokchetavskaya, Severo-Kazakhstanskaya, and Aktyubinskaya oblasts of the republic are also making major contributions to state purchases of strong and valuable varieties.

A vast and unique region for the production of strong varieties of high-quality spring wheat has been established in Kazakhstan thanks to development of the virgin and long-abandoned lands. But it is not an easy crop to grow in these parts. It takes experience, knowledge, and -- most importantly -- a creative attitude toward the work. Nature does not lavish precipitation on Kazakhstan's farmers. In the best years just over 300 millimeters falls in the northern part of the republic. Therefore, the primary concern in the struggle for the harvest is accumulating and retaining moisture. This is what the virgin lands farmers believe and, taking this into account, they have worked out a complete program of agrotechnical and organizational measures. The soil-protective system of farming developed by scientists at the All-Union Scientific Research Institute of Grain Growing and other scientific establishments in the republic is being introduced consistently at all the sovkhozes and kolkhozes.

The party committees and farm managers and specialists are devoting special attention to further improvements in seed raising, switching this sector to an industrial basis, and introducing new, higher-yielding varieties of strong wheats with good heriditary biological characteristics. On the average for 1961-1965 such varieties occupied 3.5 million hectares; in 1976-1979 the average area planted to them was more than 16 million hectares. The intensive-type "Saratovskaya-29," "Bezenchukskaya-98," "Bezostaya-1 [Beardless]," and "Mironovskaya-908" varieties have become widely planted. Farmers have been highly satisfied with the new wheat varieties "Shortandinskaya-25," "Tselinskaya-20," and "Tselinskaya-21" developed by the All-Union Scientific Research Institute of Grain Growing and the "Omskaya-9" variety developed by the Siberian Scientific Research Institute of Agriculture. A precise system of variety replacement has been worked out and is in use in the republic. The four year plan for production of elite and first-reporduction spring wheat seeds was 135 percent fulfilled. The seed fields are planted mainly with seeds of no lower than the third reproduction, classified as first or second class by the seed standard.

Optimal planting times for spring wheat have been determined through long years of study by scientists and the experience of leading farms located in all the soil-climatic zones of the republic. They are one of the most important factors in raising the yield and quality of the grain. For another thing, fertilizers are being used more effectively. Scientific tests and practical experience have proven that one-time application of 3.5 quintals of superphosphate produces a yield gain of up to 10 quintals per hectare in a five-field field crop rotation for four years. In addition, it significantly increases the gluten content in the grain and speeds up its ripening. The progressive technique of applying granulated phosphorus fertilizers in the rows along with the seed has a substantial impact. Almost one-fourth of the strong wheat fields were planted by this method this year.

The technology of harvesting strong wheat has been refined with application to local conditions. It involves application of a combination of swath and straight-through harvesting differentiated depending on the condition of the grain, weather conditions, and other factors. In some years 80-90 percent of the fields are harvested by the swath method.

A set of organizational measures is aimed at drawing the maximum amount of strong wheat into state purchases. Three years ago the Kazakh SSR ministries of Agriculture and Procurements issued a joint decree entitled, "Recommendations on Preliminary Assessment of the Quality of Strong, Hard, and Valuable Varieties of Wheat, Brewing Barley, and Valuable Varieties of Other Crops." The order was based on the progressive know-how of the virgin lands sovkhozes that had set up special laboratories which sort out uniform batches of grain at the threshing floor, before it is hauled to the elevators. Last year operational grain quality groups were used in 11 oblasts and 104 rayons of the republic. They are usually headed by chief state inspectors and include the most experienced specialists from the farms and grain-receiving enterprises.

The sovkhozes and kolkhozes are now better supplied with grain cleaning equipment. They have 6,500 grain-cleaning points with a total daily productivity of 1.3 million tons. The grain-receiving points have established a good material-technical base. They are able to receive and process about 1.2 million tons of grain and dry more than 500,000 tons each day. The grain is delivered from the threshing floors to the elevators, received, and placed according to hourly schedules and production charts. This demands that the people working along the "conveyor" from the fields to the threshing floors and on to the elevators have thorough knowledge and take a more creative approach to their work. Great attention is focused on training these cadres. Seminar-meetings with division agronomists, threshing floor managers, and laboratory workers are being held in many places. Oblast contests among laboratory workers are being conducted to win the title "Best in the Profession." Last year the collective of the Dzhetygara elevator did especially well, laying in more than 150,000 tons of strong wheat.

A good deal has been done, of course. There is still much more, however, that should be done to achieve better quality indicators. Every farm has reserves to do this. Unfortunately, some party organizations, managers, and specialists are not yet mobilizing their collectives to meet this important state challenge. In some places the accountability of workers has diminished, farming practices are not sophisticated, and great variations in yield occur; all of these things result in losses of grain. But our farmers also face difficulties that cannot be overcome without the help of certain USSR ministries. The problem of supplying virgin lands farms with highly productive machinery that can do the necessary jobs on time, which is a matter not of months but literally of days, is urgent. It is no secret that a large amount of grain that is raised loses its "strength" because it is not harvested on time. The virgin lands farmers have been waiting a long time for machine builders to supply them with wide-swath mowers and highly productive combines.

Phosphorus fertilizers produce a high return in the virgin lands of Kazakhstan. But our republic receives only a very small supply of them, so farms in Kustanayskaya, Kokchetavskaya, Turgayskaya, Tselinogradskaya, and other oblasts can only apply commercial fertilizers to one-fifth of the area planted in grain.

Another problem is that the methods used to analyze the gluten content in wheat are imperfect. The time has come to mechanize all the processes of grain analysis as fully as possible and supply the farms with the necessary laboratory equipment.

Finally, it is essential to work out a system of material incentives for the specialists and managers of the sovkhozes, kolkhozes, and agricultural and procurement agencies for increasing the production and state purchases of strong and hard varieties of wheat. Solving these problems will open up new opportunities to increase the efficiency of grain production.

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CSO: 1824

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END OF FICHE

DATE FILMED

October 29, 1980

Debbie